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THE PROPAGATION OF MOUSE TUMOURS BY MEANS OF DRIED TISSUE*

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My first duty is to say that anything which is new in this lecture is the joint work of my colleagues, Dr. A. M. Begg, Dr. James Craigie, F.R.S., Miss Ida Mann, F.R.C.S., and myself. I have great pleasure in thanking them for their permission to mention researches for which we are all jointly responsible.

Most of us have heard the remark made that too much and too little is known about cancer. We know so much now about starting cancers by physical and chemical means and so much about the chemistry and biochemistry of cancer that the literature has become confused. But we do not yet know the cause of cancer, and of course we cannot, except in early favourable cases, cure it with certainty; and all this appears to be lamentable. Are we quite certain that we have studied carefully enough the work of the pioneers of cancer research—that we have not missed some clue which was clearly revealed forty or more years ago?

A brief survey of the early work of the Imperial Cancer Research Fund, which is representative of the researches of the earliest workers in experimental cancer research, is useful and rewarding.

The work which proved that the familiar animal tumours of mice, rats, and other small mammals are pathologically and biologically of the same nature as tumours of man may be passed over, though even now there are diehards in the ranks of the profession who apparently consider that no work counts unless done on man. Similarly the statistical work of Bashford, the study of the zoological distribution of cancer by Murray, and the variety of histological forms of the disease may for present purposes be neglected. Let us confine our attention for the moment to a consideration of the prime interests of the pioneers like Jensen, Bashford, Ehrlich, Leo Loeb, Borrel, and the many others who helped to lay the foundations of cancer research.

First of all Bashford clearly asked himself the question, What do I mean by the cause of cancer? He knew, like all the medical world of his time, that soot caused an excess of skin cancer in chimney-sweeps, and that coal-tar was responsible for much skin cancer. Indeed, in the famous memorandum on research which Bashford drew up for the Committee of the Fund one of the items specifically mentioned—this was in 1902—was the proposal to test whether Pott's observations on the carcinogenic properties of soot on man applied also to mice. For various reasons this was not carried out; it was left for Passey to do in 1920. As everybody knows, soot does start cancer in mice.

Bashford in his inquiries into the ethnological distribution drew attention to the occurrence of squamous epitheliomas of the abdominal skin of the natives of India who wear the Kangri basket for warmth. He arrived at the obvious conclusions that long-continued application of heat leads to the occurrence of cancer and, more important still, to the obvious error of the Cohnheim hypothesis of the origin of cancer in cell rests, since, so far as he could determine, cancer of the abdominal skin was confined to those natives who wore the Kangri basket, and it is unlikely that these were the only men who had skin rests in the abdominal wall. He also wrote a great deal about betel-nut chewing and buccal cancer. But to Bashford, as to all the early workers in cancer, soot and tar and Kangri baskets were remote causes of the disease: they promote or precipitate cancer but play no further part.

The First Experimental Tumour

The first tumour produced experimentally was by the application of *x* rays to the root of the tail of the rat. This was done by Clunet, in France. It is of course only the deliberate application to a small animal of the same process which the pioneers of radium and *x* rays did unwittingly to themselves in the course of their professional work. Nobody could suppose that the tumour incidence was independent of the *x* rays; and nobody could believe that the *x* rays continued to act after the tumour had started or, in the case of the rat, could have any effect on the long succession of tumours in an unlimited series obtained by grafting small pieces in healthy rats. Bashford especially, and the contemporary workers incidentally, always distinguished sharply between what I have usually described as remote or adjuvant causes—chemical, physical, or parasitic—which lead to cancer and the intracellular continuing cause. This continuing cause is related to the pathological nature of cancer and is, in the sense in which we say that the tubercle bacillus is the cause of tuberculosis, the cause of cancer.

But at this point comes the real difficulty of the subject. Bashford and his colleagues could not find anything bacterial or chemical in tumour tissue that could start a new tumour. Any extract, freed of tumour cells, failed to cause the formation of a new tumour; likewise any tumour even partially dried was inactive. The tumours, in Bashford's sense, appeared to be causeless—that is, there was no continuing cause. Any procedure, however mild, which destroyed the life of the cancer cell destroyed all activity of the tumour after its inoculation into an appropriate animal.

Tumour-grafting

These findings corresponded beautifully with the findings of the process of grafting tumours. When a small fragment of a mouse tumour is placed under the skin of another mouse it was found—and this has been confirmed by workers all over the world—that the non-malignant tissues, the blood and lymph vessels and connective tissue

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which constitute the stroma of a tumour, die rapidly; the central cells of the implanted tumour mass die more slowly, the peripheral cells of the graft alone surviving; a new stroma is formed by the new host, and this stroma nourishes the surviving malignant cells, which grow and multiply and form the daughter tumour. Bashford concluded, after a vast amount of work, that "cancer can only be transmitted experimentally by processes which allow of the continued growth of the tumour of one animal in other animals of the same species." He could find no evidence, nor could anybody else, which upset this conclusion, and therefore it appeared to him that it is not permissible to seek for the cause of cancer outside the life processes of the cells.

This naturally led Dr. Murray, Bashford's first assistant, to study cells, normal and malignant, with the greatest care to determine whether there is any difference which might account for the properties of malignant cells. Murray, who had worked for several years with Boveri, was naturally interested in the speculations which might usefully be summarized under the term "mutation," but he could find no evidence which justified any belief or confidence in such speculations. Thus the Fund's scientific staff arrived at the position in 1914 that cancers are, in a phrase familiar at that time, just "personal experiences" with no cause except possibly some intracellular distortion which in our then state of knowledge was undiscoverable. The situation, one of extreme pessimism, is illustrated by Ehrlich's reply to a young man who wished to do cancer research: "I have wasted 15 years of my life in cancer research. Until some fundamental discovery is made revealing the nature of life itself not a step forward will be made in our knowledge of cancer."

The First Chicken Sarcoma

In 1910 there came into the possession of Dr. Peyton Rous, of the Rockefeller Institute, a hen bearing a tumour which histologically was universally diagnosed as a spindle-cell sarcoma. This diagnosis was changed the following year—not by Rous—when Rous proved that cell-free extracts contained an agent which was capable of starting the tumour afresh in appropriate chickens. Here was an entirely new fact. All the laborious efforts of workers to do just this with filtrates of mouse, rat, and guinea-pig tumours had failed. The first chicken sarcoma examined by Rous succeeded, and pathologists and surgeons interested in cancer at once denied the malignant nature of the chicken tumours. The agent which multiplies with the growth of the tumour is now recognized as a virus. Electron-microscope photographs have been taken, and the sizes revealed by such photographs are in fair harmony with sizes deduced from experiments with collodion filters. The virus is more or less spherical and occurs in clumps in the tumour cells.

Now we know of several hundred filterable tumours of the domestic hen. They are of different structures: some, but very few, are simple spindle-cell tumours resembling the Rous sarcoma; others include chondromas, osteochondromas, fibrosarcomas, myxosarcomas, muscle-cell tumours, and so on.

There is one strange character possessed by all these tumours which must be mentioned. When a tumour is propagated by grafting with living cells it is to be expected that the daughter tumour, if derived entirely by growth and multiplication of the implanted malignant cells, would be of the same histological type as the original tumour. With the propagation of tumours by means of cell-free filtrates the new tumour is literally new; it is made up of the host's cells which have been infected by the inoculated virus. But it has universally been found that the inoculated virus can start a tumour only of the kind from which it is derived. Thus a spindle-cell tumour always gives rise to a spindle-cell tumour, an endothelioma to an endothelioma, and so on. The virus is so specialized in its effects that it represents in itself all the qualities and properties of the cell from which it is derived. Nevertheless an immune serum made by injecting virus from one tumour will neutralize the viruses from other types of tumour which indicates a common antigenic element.

Filterable and Non-filterable Tumours

It will clearly be seen from this brief account of various sorts of tumours that there is a fundamental difference of a strange kind between filterable virus tumours and the non-filterable mouse tumours; the tumours of chickens, the adenocarcinoma of the frog, the Shope papilloma of the rabbit, and now the mammary cancers of inbred mice all have a virus as a continuing cause, whilst the vast majority of tumours of the small mammals, and presumably of man, apparently have no continuing cause.

If one dwells exclusively on the non-filterable tumours one is driven to theorize and even to accept almost impossible explanations of cancer and to dismiss the tumours from which a virus can be obtained as a disease *sui generis*. But this cannot be done convincingly; for the filterable tumours of chickens possess all the properties which everybody acknowledges as being those of cancer and none other except this one property of transmissibility with filtrates and dried tissue. Manifestly if mouse tumours which have hitherto resisted such cell-free propagation could be so propagated, and especially if newer methods had to be worked out to achieve this success, the apparent fundamental dichotomy of tumours would disappear and we should then be able to include such tumours among the filterable tumours without any strain in our minds. We should be able to regard tumours in general as being of one sort, as collections of cells carrying an active virus as the intrinsic cause.

My colleagues and I have considered cancer literature very carefully and have come to the conclusion that two facts discovered long ago are possibly the key to the general problem of cancer causation. I shall now deal with these in turn.

Transformation of Stroma of Epithelial Tumours

The first fact is the occurrence of sarcomatous transformation of the stroma of epithelial tumours. This was observed independently by Bashford and Ehrlich, and was worked out by the late Professor Haaland in our laboratories and by the late Dr. Apolant in Ehrlich's laboratory at Frankfurt. It was shown by histological methods that the spindle-cell tumour arises from normal stromal connective tissue cells and is not, as sometimes happens in animal and human tumours, an alteration in shape and appearance of the epithelial malignant cells. In other words, the epithelial cells influence the normal well-behaved connective-tissue cells, which then assume malignant properties. Either something passes from the malignant cell to the normal cell, or the normal cell just imitates the neighbouring malignant epithelial cell. Can we assume that a virus passes and becomes gradually adapted to the normal cell? This becomes more probable when we consider the frequency of this occurrence in the inbred strains of mice.

It is now common knowledge that by brother-sister mating of selected mice it is possible to get homozygous strains of mice in which 90% or even more of the females develop mammary cancer. When one of these tumours is transplanted in the normal stock of the same strain the graft always takes; transplantation is easy and certain.

was observed by Dr. Gorer at the Lister Institute in 1937 that transplants of mammary cancers in inbred strains show sarcomatous transformation very readily—in about 70%—whereas in ordinary non-inbred mice it is an infrequent occurrence. We have considered this fact very carefully and have adopted the working hypothesis that the process of inbreeding for cancer is quite different from inbreeding for unit characters such as coat colour; these are incidental to such breeding. We have looked upon the process as a means of selecting the most active or virulent strain of virus, which has now been shown in these tumours. Certainly unless the tumour incidence is carefully watched and a main cancer line is kept the incidence of tumours falls from 90% to 40 or even 20%; and this fall is independent of the brother-sister mating. It is due, as W. S. Murray has proved, to a change in what he calls the "tumour inciter"—i.e., the virus—which presumably loses some of its pathogenicity.

Effect of Cold

The second fact is one which was discovered by Ehrlich and published in 1907. It is this: that cancers, both sarcomas and carcinomas, can be kept at the low temperature of −10° C. for as long as two years, and when transplanted again give rise to the same tumour. With the exception of my late colleague Dr. W. Cramer, all who have repeated the experiment have concluded that the cancer cells have survived this prolonged freezing. Cramer was more cautious, and gave very cogent reasons for his doubts. It must be remembered that cells which are kept at a temperature of −10° C. are not just frozen *en bloc*. This temperature is cold indeed, but its action on cells is disintegrative. Water is turned to ice, but the salts in the cells do not come out with the water until a temperature of −21.1° C. is reached. Thus the internal medium of the cells is a strong solution—15 to 20%—of brine. The cells are "cured" as bacon is "cured"; nevertheless this experience of Ehrlich's has been uniformly, except by Cramer, interpreted as a marvellous example of the resistance of cancer cells to adverse conditions.

Further, it is quite well known that malignant cells which are kept at ice-box temperature, around 0° C., lose their capacity to start tumours again in a few days' time. The truth is, of course, that the failure of the early workers to find a continuing cause in tumours bit so deeply into the mind that there was no inclination to look at facts dispassionately. Moreover, the experience of histopathologists of the nineteenth century, especially that of Ribbert, had an enormous influence on the thinking of experimental workers.

Reinvestigation

We have reinvestigated the whole subject. The first step was a comparison of the effects of cold on normal tissues. The method lay readily to hand. Several years ago Miss Mann investigated the growth of embryonic tissue in inbred mice. It was already known that embryonic tissue of laboratory stock mice survives for some days in mice which are not inbred; the embryo tissue and the tissues of recipient mice are different antigenically, and those reactions which are set up against foreign proteins come into play very soon and lead to the death and destruction of the implanted embryonic tissue. In homozygous mice in which the tissues are identical chemically no such reactions occur; the embryonic tissue is not resisted, and consequently it grows to form an embryoma which persists practically indefinitely. The cells are at home, and the recipient mice accept them readily. Consequently it is an easy matter to determine whether cold destroys normal embryonic tissue and to prove the effects by simple grafting of such treated tissues into the same homozygous strain. After prolonged and repeated experiments Miss Mann has proved quite conclusively that normal embryonic tissue is killed after less than an hour's exposure to a temperature of −79° C., whereas malignant tissues survive such a temperature for a period of more than one year—it may be, so far as we know, indefinitely.

The second stage in the investigation was an examination microscopically of grafts of malignant tissue that had been transplanted into a number of mice which were killed at various intervals from hours to days. This form of investigation is designed to find what happens to the graft, to see whether the tumour which forms after inoculation of refrigerated tumour tissue into appropriate animals is derived from surviving cells—i.e., a continuation of the tumour by growth and division of the original cells—or whether it is a new tumour of the recipient mouse's own tissues. This form of experiment I had already carried out 20 years ago, and the same results were noted in this repetition. With tumours which have been subjected to a temperature of −79° C. the whole mass of implanted tissue shows no normal cells; they stain yellow with picric acid after a sojourn of two days in a mouse, or a structureless pink with eosin; the cells and nuclei are structureless; the mass of necrotic tumour tissue becomes surrounded by reaction tissue, becomes shrunken, and eventually disappears.

With sarcomas the new tumour forms in the capsule of tissue which is derived from the host. Occasionally when refrigeration is very short, a matter of minutes, an obvious malignant cell, best recognized when carcinomas are used, is found in the mass, and from this cell a daughter tumour arises by growth and multiplication of such a surviving cell. This observation, made during the time Cramer was studying the effects of refrigeration, led to a sense of insecurity, especially to one who was Bashford's pupil. The final conclusion we have reached from these studies is that malignant cells, like embryonic cells, are readily killed by extreme cold, but that dead malignant cells are nevertheless capable of starting a new, strictly new, tumour in virtue of the intrinsic virus which they contain. Comparisons with normal tissues and histological studies, however, do not give the certitude which is necessary when the issues are as important as they are in this work.

Tumour Transmission

While some of these researches were in progress Dr. Craigie, with Dr. Begg, studied the effects of extreme division of the tumour tissue and of the action of various diluents on the finely divided tumour tissue.

Normally in cancer laboratories tumour tissue is broken up or emulsified by using fine scissors to make a mince which will pass easily through a needle of very wide bore. This was not good enough for the quantitative work needed in these researches. Dr. Craigie therefore designed and had made in the Fund's workshop a new and improved tissue-mincer by which suspensions of cells in diluents such as distilled water, glucose solutions, glycerin, saline, etc., could be obtained sufficiently finely divided to pass through the finest bore of needle (26 gauge). The results obtained by injection of such fine emulsions of frozen tissue cannot be interpreted simply as being the consequence of survival of cells on freezing. For example, many diluents such as distilled water, 40% glycerin, and 40% glucose which one would expect to be lethal to cells do not prevent tumour formation, and, contrariwise, diluents such as peptone which would not be expected to kill cells on freezing do inhibit tumour growth. The whole matter is difficult and complicated, and is an obvious subject for more research. But it can be stated quite definitely that

long-continued exposure to a low temperature, as long as one year, does not affect the capacity of tumour tissue to start tumours again when injected into appropriate animals. Indeed, since we know from histology that all or nearly all cells—we can never exclude the possibility of one cell escaping microscopical attention—are killed by keeping at a temperature of −79° C., and also that tumours kept a year are often more active than corresponding fresh tumour tissue, it is in the highest degree improbable that the tumours which form after inoculation of refrigerated tissue are a mere grafting of living cells. They are much more likely to be strictly new tumours brought about by the infective action of the intracellular cause which has hitherto escaped attention.

But on this slightly uncertain note we could not end. We realized, none more definitely, that it was necessary to transmit a tumour with tissue which had been completely dried. To this we therefore turned our attention. During the past 14 years most of the mouse and rat tumours have been dried by one method or another and no success has been obtained in any single experiment. A new apparatus for drying small amounts of tissue, seldom more than a gramme, was designed by Dr. Craigie and made for us by the Glass Printers Company of Harrow. A description of it is in the scientific press. The essential improvement in this apparatus is the absence of any constriction in the path that water vapour must follow and in the power of the "backing pump." With this apparatus we have succeeded in propagating three mouse sarcomas with perfectly dry tissue. The tumours are as follows:

1. A sarcoma which was started in the inbred mice known as C57 Black by injecting about 1 mg. of the pure chemical compound methylcholanthrene. The chemical was injected in 1941; in the early months of 1942 tumours formed. From one of them transplants were made into six normal C57 mice. The tissue inoculated grew in all the mice; from one, a further transplant was made. This process of perpetuating the tumour has now been carried on for seven years; the serial number of the tumour is now nearly 200. Thus about 200 transmissions by grafting have been carried out, and during these years the tumour was dried and filtered again and again in attempts to propagate the tumour acellularly. All these attempts failed. Even tissues which were deliberately used before drying was complete and whilst the tissue was still damp failed to give rise to tumours.

2. A sarcoma of the inbred strain R3 which arose by infection of the connective-tissue stroma of a carcinoma. This is the most malignant of our transplantable tumours. It was separated from the carcinoma by rapid transfers by Dr. Ludford. It is made up of spindle cells and multinucleated giant cells; around the tumour there is usually a glairy fluid in which disintegrated cells can usually be found.

3. A sarcoma of the homozygous strain C3H. This again arose during the transplantation of a sporadic mammary carcinoma and was also purified by early transplantation of the carcinoma by Dr. Ludford.

Experimental Results

It is best to take the methylcholanthrene tumour first. It is the least malignant of the three but has been tested most often for transmissibility with cell-free extracts during the past seven years. Even now, using our most efficient drying apparatus, we have so far been unable to obtain active dry material of a tumour fresh from a mouse. To obtain active dry tissue it has been necessary to subject the tissue to the low temperature of −79° C. for five to eight weeks before drying. Even then, as the following table shows, it is not yet possible to obtain regularly active material.

It will be observed that in one experiment of this group only one tumour developed in eight mice, and this did not appear until the 24th day after inoculation. This experience has been found in other experiments. In others again, in which variations have been made in experimental methods, the results were entirely negative. But as a summary we can affirm quite definitely that it is possible to obtain perfectly dry tumour tissue which will start the tumour afresh.

Expt.	Tumour	Time of Freezing at −79° C.	No. of Mice	No. of Tumours	Time of Appearance
406 ..	C48 in C57 black	35 days	7	6	17 days
G13B ..	" " "	52 "	18	13	16-31 "
434 ..	" " "	53 "	12	9	16 "
G26 ..	" " "	105 "	8	1	24 "

It is a matter of some importance to propagate tumours in series with dry tissue. This has been started, but owing to the time needed for refrigeration before drying we have succeeded so far only in carrying through two generations and the third generation has only just been tested.

When we come to the much more malignant R3 and C3H sporadic tumours we find that both of these are capable of yielding active dry tissue when fresh tumour is dried. In two successive experiments with the R3 tumour we obtained from dry tissue of fresh tumour (derived originally from frozen material) eight tumours out of ten mice inoculated, tumours appearing 14 to 33 days later; and one tumour out of six mice, the tumour appearing in 14 days. In an experiment with the C3H strain, fresh tumour tissue dried under the optimum conditions attained so far gave six tumours in 12 inoculations, the tumours appearing in 15 to 27 days.

Even with these very malignant tumours of the R3 and C3H strains of mice it has been found that preliminary freezing is helpful. For example, in three successive experiments with the R3 tumour it was found that tissue which had been frozen 28 days gave six tumours in six mice inoculated, the tumours being observed at 11 days; tissue frozen 34 days and then dried gave 10 tumours in 10 inoculated mice, the tumours being palpable in eight days and large on the 13th day; and tissue frozen 75 days, dried and the dry powdered tissue then inoculated into six mice gave six tumours in 11 days.

We have no proof of numerous possibilities which may happen to tissue which is refrigerated for long periods of time. It is possible that low temperatures denature an inhibitory protein, thus liberating virus and making it available even after drying. The only merit this speculation possesses is that in the filterable tumours of chickens it is possible under favourable circumstances to demonstrate the presence of an inhibitory substance. This has been particularly well shown by J. B. Murphy, of the Rockefeller Institute. We have no complete proof of any of our numerous private speculations on this point; we are content merely to state what is the fact. It is possible that with more perfect methods these difficulties will vanish and speculation will become unnecessary.

At present the only conclusion from the whole work which is of vital and abiding interest is that it is no longer justifiable to put the normally easily filterable tumours of chickens in a separate class and turn a rather scornful eye on them. This work has now brought tumours of mice—average tumours found in all well-equipped cancer laboratories—into the same class. They have, as was to be expected, a continuing cause, and, since the continuing cause of chicken sarcoma is a virus, probably it is viral in nature. We have not yet transmitted other mammalian tumours with dried tissues, nor indeed have we seriously attempted to do so; but we think we are justified in making the contention that the negative results of the past are merely negative and have the value only of negative experiment which is the result of imperfect technique. If the pioneers of cancer research, men like Jensen, Ehrlich

shford, and many others, had by chance succeeded in nsmitting mouse tumours with perfectly dry tissue the uation in cancer-thinking would have been entirely fferent, and we should have been spared the confused eculations which now dominate cancer research.

There is one final point I wish to refer to—namely, hether viruses are of intrinsic or extrinsic origin. It is w almost the custom to consider the viruses of the erable tumours as particles of chemical nature made by e infected cells. Indeed, this mode of thinking has now ne so far that the word "virus" has been objected to, ough the grounds of objection do not appear to us to be lid. We are not wedded to a word; they may be called ything so far as we are concerned. It is more impor- nt to discover perfect ways of getting and handling them, find out how they act, and to learn if possible how to ntrol them. The problem of discovering the nature of ruses, whether made by cells or of extrinsic origin, is t confined to cancer viruses; it is a part of the general rus problem. There was a time when the bacteriophage as allied to cancer viruses as being a product of the bac- rial cell, but that has now passed. The argument con- rning biogenesis or abiogenesis of the Pasteur–Bastian riod does not interest us, and its repetition now, with ruses taking the place of bacteria, seems to be sterile om the beginning.

Conclusion

The experimental evidence described above points to the nclusion that cancer has a continuing cause and that this, mammals as in birds, is a virus.

LONG-TERM CARDIAC OBSERVATION OF CHILDREN

BY

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The proper assessment of cardiac signs found in a child s of considerable importance to its future. Many children whom murmurs are heard have no disability, and the greatest danger is that their activities may be restricted and the seeds sown for the development of cardiac neurosis. In rheumatic heart disease a normal school life with games can often be allowed when the disease is inactive, even when valve lesions are known to be present. With the advance of cardiac surgery it is desirable that cases for which it may be necessary should be diagnosed as early and as accurately as possible and submitted for operation at the most suitable time.

The choice of a career which will not need to be changed on account of a disability that is likely to increase should e made before leaving school. It is difficult for one who as done nothing but manual labour to find a sedentary occupation in middle life, and this can be avoided by hoosing suitable employment from the start. For these and other reasons there are great advantages in children with cardiac abnormalities being under regular observa- ion at cardiological centres. There are many questions in cardiology which can be settled only by watching patients over a period of years. J. W. Brown (1939) has done much in this way to increase our knowledge of the natural history of congenital heart disease. By similar observation much may be added to our understanding of the course of heumatic heart disease.

What happens in the years between the acute or sub- acute phase seen in the child and the young woman who is discovered to have mitral stenosis during pregnancy? Is the development of the stenosis due to recurrent activity of the rheumatic infection, or, once started, does the narrowing progress steadily without evidence of further activity, or are both factors at work? What happens to the innocent murmurs so common in childhood? At what age do they disappear?

A Cardiac Clinic for Children

With these considerations in mind a children's cardiac clinic was started eighteen months ago, and a report of the first 200 cases is here given. Apart from its intrinsic interest, the appreciation of doctors, parents, and, not least, the children themselves is encouraging and makes the clinic a happy one. As an investigation of this kind requires observation over a period of many years it is desirable that the observer should start while young enough to allow continuity of at least twenty years. It is with the idea of encouraging others who may be interested to take up such work that this preliminary report is presented.

The work has been made possible by the willing co-operation of the local school medical authorities. An afternoon is set aside and four to six children are seen by appointment each week. The number attending on each occasion is kept small so that full and unhurried examination may be made. It also means that no one is kept waiting very long—a point which makes them more willing to come again when asked.

Children showing any cardiac abnormality whatsoever at routine school examinations are placed on a list and referred to the clinic. The net is purposely cast wide to include all conditions, ranging from innocent murmurs to serious heart disease. A careful history is taken, followed by clinical examination, electrocardiograms, and cardioscopy. Twelve-lead electrocardiograms consisting of V1–6 and augmented unipolar limb leads in addition to the standard leads are now being taken in all cases, and routine phonocardiograms are to be started shortly.

If the child is very nervous or fretful the blood-pressure reading, electrocardiography, and cardioscopy may be postponed until the next attendance, as it is considered important that its memory of the visit to the cardiac department shall not be unhappy. This greatly facilitates subsequent examination. Teleradiographs are taken in cases showing abnormality on screening. Blood counts and sedimentation rates are done in certain cases. A report is sent to the school medical authorities and to the patient's own doctor. Arrangements are made for re-examination after an interval of six or twelve months or sometimes earlier.

Report of First 200 Cases

The distribution of the 200 cases is shown in Table I. There were 96 boys and 104 girls. It will be seen that approximately 40% had, or were suspected of having,

TABLE I.—*Distribution of Cases*

Cases with Organic Heart Disease.	
I. Congenital malformations (44):	
Fallot group (one with congenital heart-block)	7
Pulmonary stenosis	10
Ventricular septal defect	6
Patent ductus arteriosus	3
Coarctation of aorta	3
Atrial septal defect	3
Congenital heart-block	1
Observation—congenital heart disease	11
II. Rheumatic Heart Disease (37):	
Mitral stenosis (six with active disease)	21
Mitral stenosis and aortic incompetence	2
Observation—mitral valvular disease or cardiac enlargement	14
Cases without Organic Heart Disease (119):	
Innocent murmurs	96
Physiological third heart sound	5
Depressed sternum	1
Splitting of first heart sound	1
Anaemia	1
Displacement (scoliosis, 1; pulmonary fibrosis, 1)	2
Irregularities (sinus arrhythmia, 1; extrasystoles, 2)	3
No abnormality detected	10

organic heart disease. The remaining 60% are classified under the most prominent feature discovered. Innocent murmurs provide the majority. Many of those with murmurs also showed a third heart sound, but unless the triple rhythm was the only feature cases were not classified under it. Those with organic lesions are divided into congenital malformations and rheumatic heart disease, the former showing a slight predominance.

The "observation" group is useful and may well prove the most important over a long period. In it are placed cases that cannot be passed as normal at the first examination, but in which the signs are so slight that a definite diagnosis of heart disease is not justified. It will be of great interest to see which way these cases develop—whether the suspected abnormalities disappear, or whether a clear pattern of heart disease emerges. The group is also used for cases of congenital heart disease in which the nature of the lesion is obscure. With increasing experience more accurate diagnosis becomes possible and fewer have to be placed in this group, but there will always be a number in which a complete diagnosis cannot be made during life.

CASES WITH HEART DISEASE

CONGENITAL MALFORMATIONS

Fallot Group.—Ages ranged from 5 to 16 years. With one exception these seven cases had all been diagnosed as having heart disease in infancy; development was poor and disability varied from moderate to considerable. All showed varying degrees of enlargement on cardioscopy, but the "cœur en sabot" which has been described as characteristic of this condition was seen only twice. Blood pressure tended to be low. The expectation that all such cases will show steadily increasing disability is not supported by follow-up studies. Of six cases, four showed improvement during the first year of observation, one remained the same, and one showed increased disability and was referred for operative treatment. The improvement in two was striking: one who could walk only a few yards when first seen can walk a mile; another who used to squat had not done so for six months and was walking well. Bearing in mind the limited improvement that can be expected from a successful operation, it is desirable that surgical treatment should be reserved for those whose disability is very great and in whom progressive deterioration is occurring.

Pulmonary Stenosis.—In the majority of these ten cases the heart lesion was discovered at examination for some other purpose, and in half of them remained unnoticed until the first routine school examination at the age of 5. Disability was generally slight and physical development fair. Because of the impressively loud murmur there is a tendency to restrict the activities of such children far more than is necessary. Most of these are now playing games happily without symptoms.

Ventricular Septal Defect.—Like the preceding group these children's murmurs were usually discovered accidentally and all but one had been forbidden to play games. Of the six children in this group the only one to complain of shortness of breath was later found to have a mid-diastolic murmur and is really a case of mitral stenosis. Electrocardiograms were normal apart from slight prolongation of the P–R interval in one, and prominent S waves in lead I in two. Screening revealed slight right-sided enlargement in three; the rest were normal. All are now living an ordinary school life.

Patent Ductus Arteriosus.—One of the three cases in this series—a boy aged 9—has no symptoms. He is being watched but not operated upon meantime, as I agree with the view expressed by Benn (1947) that in symptomless cases the risk of operation may be greater than the risk of bacterial endocarditis or heart failure. The other two cases showed unusual features and are here briefly described.

One of these two patients was a girl aged 13½, the condition of whose heart was first noticed during pneumonia at the age of 4. Subsequently she suffered from recurrent respiratory infections and was often away from school for long periods. At one time she was in hospital for a year, and later she attended school for half-days only. She had an over-anxious mother and there is some doubt if all this care was really necessary. Her general condition was poor, and in addition to signs of pulmonary fibrosis there was considerable cardiac enlargement with the typical machinery murmur below the left clavicle. Blood pressure was 160/30 at rest and 170/0 after exercise. In view of her poor general condition and the size of her heart it was thought that there might be some other heart condition as well as the patent ductus. She was therefore seen by Sir John Parkinson, who agreed that operation was advisable, as the prognosis without it was bad and it might bring great improvement. She was operated upon at the London Hospital by Mr. Vernon Thompson, who found a short and very wide ductus (8 mm. in length and 11 mm. in diameter), which was tied. She made an uninterrupted recovery, and her general condition has since improved greatly. Six months after operation a systolic murmur developed in the pulmonary area and has persisted unchanged (six months). Such murmurs are sometimes heard after operation for patent ductus arteriosus, and no satisfactory explanation for them has yet been given. They are not always evidence of recanalization.

The other patient, a girl, had had a patent ductus tied at the age of 7 on account of poor physical development. She made a satisfactory recovery and was in excellent health for a year after operation. She then began to get attacks of pain across the sternum, associated with severe dyspnoea and cyanosis. They had no relation to exertion or food, but were associated with a slight rise of temperature. The attacks became more frequent, she lost weight, and her general condition deteriorated. The heart sounds remained closed and the electrocardiogram and *x*-ray film were normal. Blood culture was negative and there was no evidence of embolism. These attacks were puzzling, but they were considered cardiac in origin and it was thought that bacterial infection must have occurred, possibly in the stump of the ductus. After a six weeks course of penicillin her general condition improved greatly. She has gained weight, and the attacks, though still occurring, are milder and much less frequent.

Coarctation of the Aorta.—It is probable that this condition is very much commoner than has been thought, and when it becomes a routine to palpate the femoral arteries in all cases showing hypertension or neck pulsation many more cases will be found. Of the three cases, two, aged 15 and 9, are symptom-free. The third, aged 7, is easily tired and has had cramp in the legs at night for the last two years. Her blood pressure is normal. She was diagnosed by Dr. J. W. Brown at the age of 2½. The Crafoord operation of resection of the coarctation and end-to-end anastomosis of the aorta is a severe one, and in symptomless cases the operative risk may well be greater than the danger of rupture of the aorta, bacterial aortitis, or heart failure. A remote risk of the operation may be from weakness at the suture line when atheromatous changes occur in the aorta. For these reasons it would probably be wise to reserve operation for young patients showing symptoms of cardiac embarrassment or ischaemia of the legs, because in them the prognosis without operation is bad enough to warrant the risk.

Atrial Septal Defect.—All three patients were girls. In diagnosis the radiological appearance of enlargement of the pulmonary artery, including its right branch, with pulsation of the pulmonary vessels, was found the most useful sign. One had mitral stenosis as well (Lutembacher's syndrome), and she and one other had some shortness of breath on exertion. The third had no symptoms. This condition rarely causes heart failure before adult life and is unlikely

to be recognized in childhood unless cases with murmurs are examined radiologically.

Observation: Congenital Heart Disease.—In this group of eleven cases are three with loud systolic murmurs internal to the apex. No thrill has been felt, but it is considered probable that they are cases of ventricular septal defect. Two other cases show cardiac enlargement on screening. In another it is probable that the disability is entirely due to bronchitis and that the heart is normal. The remaining five cases are suspected of having pulmonary stenosis, atrial septal defect (2), patent ductus arteriosus, and the Eisenmenger complex. When the diagnosis is considered to be established they will be placed in the appropriate groups.

RHEUMATIC GROUP

This group comprises all the cases of proved and suspected mitral stenosis, those with a history of rheumatic fever or chorea with a noticeable systolic murmur, and those suspected of having active rheumatic infection. No cases of aortic incompetence without mitral stenosis have been seen in this series, though it is expected that in some of the cases of slight cardiac enlargement an early diastolic murmur may be heard on future examination.

Mitral Stenosis.—Of the 21 proved cases of mitral stenosis 13 were girls and 8 boys. Seventeen were between the ages of 10 and 15. Fourteen gave a history of rheumatic fever or chorea. In seven no history suggestive of rheumatic infection could be obtained. The commonest physical sign was a systolic murmur at the apex, which was heard in all. The first heart sound was loud in 15 and mid-diastolic murmurs and presystolic murmurs were heard in 14 and 6 respectively. The diastolic murmurs were always better heard lying than standing, and best when lying on the left side after exercise. On cardioscopy 16 showed enlargement of the left auricle in the right oblique position with barium in the oesophagus. Two others showed slight general enlargement with a straight left border, and three were normal on screening. None had severe disability, and, provided there had been no recent rheumatic activity, they were not restricted beyond what they could do in comfort. Two who had active carditis were admitted to hospital. Another, when apparently well, developed an acute infection with consolidation of the left lower lobe and died in a week.

Of the 13 cases under observation for mitral stenosis 8 are females and 5 males. Seven gave a history of rheumatic fever or chorea and had systolic murmurs with or without a loud first sound. Three had systolic murmurs with cardiac enlargement on *x*-ray examination. Three others had systolic murmurs only, but of such a character that these could not be passed immediately as innocent murmurs. It should be emphasized that the cases in this group are not restricted in any way whatsoever, but are being watched at intervals of six to twelve months to see how they develop.

CASES WITHOUT HEART DISEASE

These cases are most important, for they are healthy children whose whole lives may be blighted by a mistaken diagnosis of heart disease. A few examples may be quoted.

Girl aged 7; parents told "heart bad" when she was 2 years old. Never allowed games or drill, and spent one day a week in bed.

Girl aged 14. Examined on account of nose-bleeding at 5; told "valvular trouble." Since then had never been allowed games, drill, swimming, or dancing.

Boy aged 14½. Heart examined at 4; no games or drill since.

All these children have healthy hearts and are now playing full games without distress.

Innocent Murmurs.—These account for nearly half the total number of cases. They have been classified and their characteristics described by Evans (1947). The majority are better heard in the reclining posture. They have a soft blowing character and are usually diminished or abolished by deep inspiration. They do not occur early in systole, and a gap can often be detected between the first sound and the murmur. It is hoped that phonocardiography may assist in distinguishing these murmurs more clearly. Table II shows the great preponderance of murmurs better heard in the reclining posture and the high proportion in which a physiological third sound was heard in such cases.

TABLE II.—*96 Healthy Children with an Innocent Murmur*

Type (Evans's Classification)	No.	Boys	Girls	Third Heart Sound Present
Murmur of reclining posture ..	90	54	36	71
Murmur of upright posture ..	4	—	4	1
Parasternal murmur	2	1	1	2

Triple Rhythm.—A third heart sound was heard in 100 cases. In five it was the only sign. In 83 it occurred in healthy hearts, in 3 with congenital heart disease, and in 14 cases under observation for possible rheumatic or congenital disease. The distribution is shown in Table III.

TABLE III.—*100 Cases of Triple Rhythm*

Cases without Heart Disease (83):	
Alone	5
With innocent murmurs	75
With anaemia, scoliosis, and pulmonary fibrosis (1 each) ..	3
Cases with Congenital Heart Disease (3):	
Atrial septal defect	2
Coarctation of aorta	1
Cases under Observation (14):	
For mitral valvular disease	8
For congenital heart disease	6

Depressed Sternum.—Only one case occurred in this series. Evans (1946) has pointed out that with this deformity the heart may be flattened between the spine and the depressed sternum. This may give rise to a systolic murmur and also give an impression of cardiac enlargement by outward displacement of the apex beat. This apparent cardiac enlargement may be noted on cardioscopy in the antero-posterior position, but the true cause may be suspected from the unusual translucency of the cardiac shadow and be proved by examination in the oblique position. With deeper depression of the sternum the heart may be dislocated to the left, causing great displacement of the apex, The condition is harmless, and is important only as a possible cause of unnecessary invalidism.

Splitting of the First Heart Sound.—It is surprising that this was heard only once among 200 children, for it is a common sign. Its importance lies in the fact that it is often mistaken for the presystolic murmur of mitral stenosis. Splitting is best heard in the upright posture over the lower sternum; the first sound is not loud and there is none of the crescendo quality of the true presystolic murmur. It is in fact a simple splitting and not a murmur.

Displacement of the Heart.—Scoliosis is the commonest cause of displacement of the apex beat in children, and when this is outwards it may give rise to a suspicion of cardiac enlargement. The condition is usually recognized by observing that one shoulder is higher than the other. It is most easily seen on screening, when by rotating the patient to correct the deformity the normal size of the heart is apparent.

Other Factors

Blood Pressure.—This was recorded in 180 cases, and the results were examined to see whether there was any striking difference according to age, sex, or the presence of heart disease. The numbers are too small for statistical

analysis, but it was found that in healthy children under the age of 10 the systolic blood pressure was less than 100 mm. Hg in 60% of boys and 30% of girls.

Electrocardiography.—Only standard leads and CR1 were taken in the majority, as twelve-lead cardiograms were not started until late in the series. The more complete records should help in the assessment of right or left ventricular preponderance. It is not proposed to give here a detailed description of the present findings, but two observations can be made. Sinus arrhythmia of a degree easily perceptible to the eye without measurement was seen in 97 out of 195 cases. Of these, 68 out of 117 were in healthy hearts, 14 out of 42 in the congenital group, and 15 out of 36 in the rheumatic group, including three with active carditis. This supports the view that sinus arrhythmia is of no value in helping to determine the condition of the heart.

It has been suggested that a physiological third sound, prominence of the pulmonary artery on cardioscopy, and inversion of the T wave in CR1 may be linked as a triad of physiological right ventricular preponderance. The direction of the T wave in CR1 was therefore studied in 94 cases showing a third heart sound. It was inverted in 12, diphasic (− +) in 32, flat in 1, diphasic (+ −) in 5, upright in 42, and bizarre in 2.

Radiological Examination.—The ease with which the cardiac silhouette can be seen in children contrasts pleasantly with the difficulty so often encountered in obese adults. The child's heart tends to look a little larger in relation to the size of the chest. Cardioscopy is of great assistance in attempting to separate the congenital malformations and in the early diagnosis of mitral stenosis. It is also of value as a check on clinical observation, and in more than one case in this series the appearance of cardiac enlargement led to re-examination, with the discovery of signs that had been missed before.

Restriction and Cardiac Invalidism

The proportion of those whose activities had been restricted on medical advice is shown in Table IV. In those without heart disease it was encouraging to note that

TABLE IV

Group	No.	Activities Restricted on Medical Advice				
		No Symptoms	Slight Symptoms	Moderate to Severe Symptoms	Unnecessary Cardiac Invalidism	Total
Healthy hearts ..	119	29	9	1 (neurosis)	39	39
Congenital ..	44	17	7	7	24	31
Rheumatic ..	37	16	2	8 (6 active)	18	26

although in the first hundred of the series 26 out of 55 had been restricted, in the second hundred only 13 out of 64 had had their activities curtailed. In view of the rapidity with which a cardiac neurosis can develop it is surprising that such a high proportion of those restricted had remained symptom-free. In contrast was a girl, referred on account of an innocent murmur, who complained of shortness of breath for the first time during the fortnight while waiting for an appointment at the cardiac department.

What limitation should be placed upon the activities of children with heart disease is a more controversial subject. All would agree that while any suspicion of active rheumatic infection exists rest should be advised, and in certain cases of congenital heart disease with severe disability there is no choice, for the heart itself imposes limitations. Patients with coarctation of the aorta in which a sudden strain may prove fatal should also have their activities limited.

These cases, however, are in the minority, and there are large numbers of children with gross signs of definite heart disease who have little or no limitation of exercise tolerance. Should they be prevented from enjoying the activities in which they are so keen to take part? On this subject we have the authority of Sir James Mackenzie (1917), who stated: "Children with a heart the efficiency of which is impaired will not injure it by over-exertion. Children are very sensitive to distress provoked by cardiac inefficiency and will themselves abstain without being told. . . . I cannot recall a single instance where I could reasonably attribute heart-failure to a child's voluntary exertions. The same reasoning applies to the games of boys and girls; when they exert themselves and find pleasure in doing so it may be taken for granted that no harm results."

If this opinion is accepted—and I think it should be—the restriction in all those cases without symptoms or with only minimal symptoms becomes unnecessary, and these children may be allowed to indulge in games, their own feelings being the best guide. It is my opinion that from a cardiac point of view the only valid reasons for stopping a child's normal school activities are active rheumatic infection or disease causing cardiac embarrassment of a degree which makes exertion uncomfortable.

Discussion

The main objectives are that children with heart disease shall lead as full and happy lives as possible, and that no suspicion of heart disease shall be allowed to remain in the minds of those who are healthy. Too often the child with some innocent or benign cardiac condition has been kept from games, drill, swimming, and dancing—in fact all the pleasures of school life. School medical officers may change, and newcomers are chary of questioning the judgment of their predecessors. Once the child has been placed on the restricted list few dare to raise the ban, and it may be treated as an invalid through the whole of its school life. It is not surprising in these circumstances that it grows up neurotic.

It is not advocated that children with severe disability should be driven to undertake activities which they can perform only with difficulty. Even those with impaired efficiency may be able to join in all but the more strenuous forms of competitive sport. The majority of these children who have been deprived of physical exercise in school are most anxious to join in with the others, and in unofficial games are often reported to be above average in the activity they display. They resent bitterly not being allowed to lead a normal life, and their joy at being told that they can do so knows no bounds. It is inevitable that such liberation of children who have been over-protected for years will sometimes cause parents to wonder whether the past restriction has been really necessary. Such difficulties are encountered only in the early months, and disappear when all cases are being referred to a cardiac clinic as soon as an abnormality is noticed and before restriction is instituted.

It might be thought that this work should be confined to centres where all the more specialized investigations, such as angiocardiography, kymography, and cardiac catheterization with blood gas analysis, are available. The proportion of cases in which these are necessary for diagnosis is small, and while they add to the observer's interest they are not often essential for the benefit of the patient. It will be agreed that cardiac surgery should be undertaken only at a very few centres, so that a small number of surgeons may acquire the necessary experience to perform these operations with the greatest efficiency. When these special investigations are considered necessary they could be carried out at such a centre before operation. It would

be impossible to provide enough of these highly specialized clinics to examine more than a small proportion of the children with cardiac abnormalities. It should not be difficult, however, to cover the country by a series of centres, so that every child in whom any cardiac abnormality is suspected should have the benefit of examination and supervision by a physician specializing in cardiology. In this way much unnecessary cardiac invalidism would be prevented.

Summary

The work of a children's cardiac clinic is described, and a report presented of the first 200 cases seen.

It is suggested that the setting up of similar clinics in areas where they are not already in operation would add to our knowledge and be of great benefit to the children.

I should like to thank Dr. John Matthews, senior school medical officer, Brighton, for his willing co-operation, and Miss V. Amato, cardiographer to the department, for her technical assistance.

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HOG-STOMACH EXTRACT AND CASEIN HYDROLYSATE IN PEPTIC ULCER

BY

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It is notoriously difficult to evaluate the results of treatment in a disease such as peptic ulcer which follows an irregular course of relapse and remission. A spontaneous remission (especially if it should last for several weeks) is apt to be falsely attributed to the method of treatment in operation at the time. A system of study has been evolved in this clinic which would seem to avoid such a fallacy. The purpose of this paper is to describe the experimental method and to illustrate its application by reporting an investigation of two forms of treatment recently advocated—namely, the administration of hog-stomach extract and of casein hydrolysate.

Method of Study

The test substance is administered for three months and then withheld for three months, this sequence being repeated without reference to the presence or absence of dyspepsia. By the end of twelve months there are available for comparison two test periods and two control periods, during which (in the absence of benefit from the test substance) relapses can be expected with equal frequency. It is to be noted that relapses normally terminate spontaneously, and consequently the first improvement after the beginning of therapy must be discounted.

There can be little doubt that, in general, relapses tend to be more frequent in winter than in summer, and for this reason it was felt that the clinical trial should cover the period of a full year. The possibility was foreseen that in the periods between the administration of the test substance the patients might regard themselves as untreated. To minimize this the proposed plan of treatment was explained at the start; partly through this explanation, and partly through conversation with other patients undergoing the same test, the control periods came to be accepted as an integral part of a planned course of treatment. Finally, patients were interviewed at the same intervals of time during the test and control periods so that the records might have the same degree of precision.

All the patients selected for study had radiological evidence of duodenal or gastric ulceration, and in each case the periodicity of relapse and of remission was well defined. Every patient had had symptoms for many years (average 12½ years) and the chance of spontaneous cure was considered to be remote. No change was made in the customary dietary habits of the patients save in one small group treated by intensive casein hydrolysate therapy (see below). Alkalis were permitted when pain was severe.

Hog-stomach Extract

The beneficial effects of feeding human gastric juice from normal subjects to patients with peptic ulcer have been described by Morrison (1945a). In an attempt to explain the prompt relief of symptoms it was suggested that the normal gastric mucosa is capable of elaborating a principle which protects the stomach from self-digestion and peptic ulceration. Developing this hypothesis, Morrison (1945b) was successful in preventing the occurrence of cinchophen ulcers in dogs by feeding them a preparation extracted from the mucosa and submucosa of the hog's stomach and duodenum. This was done with the intention of providing the "protective factor."

We present the results of a clinical trial of "pepsac," a commercial extract of fresh hogs' stomachs, in patients with peptic ulcer.

Dosage.—Pepsac was administered in doses of one tablespoonful (approximately 30 g.) three times a day in any vehicle palatable to the individual. In order to avoid destruction of any thermolabile active principle the temperature of the mixture was not allowed to exceed blood heat.

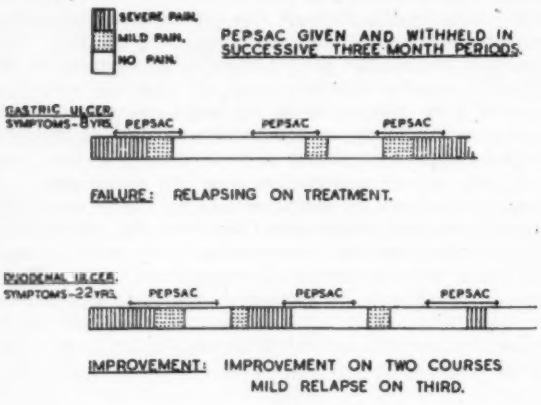
Results.—Observations were made on 41 patients (33 duodenal ulcer, 7 gastric ulcer, 1 stomal ulcer), with the following results:

Incomplete trial	8
? Incomplete trial or ? failure	7
Failure	17
Benefit	9

The patients given an incomplete trial include six who could not tolerate the preparation and two who defaulted. Seven patients continued to have severe disability, and the trial was abandoned in favour of in-patient hospital treatment; it is a matter of opinion whether these should be classified under "incomplete trial" or "failure." The 17 patients classed as failures (15 duodenal, 2 gastric) experienced no improvement in either the frequency or the severity of their relapses. In the remaining 9 patients (5 duodenal, 3 gastric, 1 stomal) some degree of benefit was obtained: in four of these the relapses became shorter and the remissions longer, and in five the periodicity was unchanged but the attacks were said to be less severe. The chart provides a diagrammatic representation of the clinical progress in two experiments and illustrates the method of study. During the period of investigation only one patient failed to gain weight.

Comment.—In most cases the addition of pepsac to the diet led to no symptomatic improvement despite a gain

in weight. Although the preparation is clearly nutritious there is no evidence that it contains an anti-ulcer factor.



Casein Hydrolysate

Co Tui *et al.* (1945, 1946, 1947) found that hyperalimentation with protein hydrolysate promptly relieved peptic ulcer distress. This benefit was ascribed to the ease with which protein hydrolysate can be assimilated and used for tissue-building, and also to its properties as an antacid.

We present the results of a clinical trial of "casydrol" in patients with peptic ulcer. Casydrol is an enzymic hydrolysate of fat-free whole milk containing approximately equal parts of amino-acids (with polypeptides) and readily assimilable carbohydrate.

Dosage

In one group of patients one heaped tablespoonful of casydrol was given three times a day (approximately 50 g. daily). This amount was considered to be adequate, as our patients regarded casydrol as "medicine" and took it in addition to their normal diet.

In a second group we departed from the method of trial described above in order to repeat the experiments of Co Tui *et al.* (1945). For this purpose seven patients were given casydrol exclusively for seven days. Hourly feeds consisting of four tablespoonfuls of casydrol in warm water were given from 7 a.m. until 9 p.m. The daily intake of casydrol was 600 g., providing a yield of 2,160 calories. On completion of this seven-day intensive course patients were given normal diet with a casydrol feed between meals. For this experiment seven male patients suffering severe duodenal ulcer pain were admitted to hospital. This was considered necessary, as it seemed unlikely that even the conscientious peptic ulcer patient would adhere to hourly feeding of a rather unpalatable mixture in the absence of supervision. Although in hospital, these patients were ambulant for the greater part of each day.

Results

1. Casydrol as a Supplement to Normal Diet.—Casydrol therapy was given to 16 patients (13 duodenal, 3 gastric). Four patients defaulted after six to eight weeks of treatment, during which symptoms had remained unchanged. These patients were regarded as having had an incomplete trial. Ten patients who continued to have pain while on treatment and in whom there was no improvement in the periodicity of relapse and remission were considered to be failures. In two cases a severe relapse was curtailed by the administration of casydrol, but in only one was the remission longer than usual. All patients gained weight on casydrol therapy, the increase varying between 1½ and 21 lb. (0.68 and 9.53 kg.).

2. Casydrol as Sole Source of Food Nitrogen.—Brief summaries of the seven cases treated by intensive casydrol therapy follow.

Case 1.—Man aged 30. Pain was relieved on the fifth day of treatment, and he remained symptom-free on return to diet plus casydrol. Pain recurred on the 14th day, and he had a haematemesis on the 30th day. Weight gain, 2 lb. (0.91 kg.). (*Failure.*)

Case 2.—Man aged 28. Pain remained unchanged in frequency and in severity at the end of the seven-day course of treatment. Gained 2½ lb. (1.13 kg.). (*Failure.*)

Case 3.—Man aged 25. Symptom-free after 48 hours' treatment. Dismissed without pain on the eighth day. Weight gain, 1½ lb. (0.68 kg.). (*Improvement.*)

Case 4.—Man aged 34. Symptom-free on the fifth day of treatment. Severe recurrence on the last day of treatment. Continuous pain for the next six weeks. Gastrectomy advised. Weight gain, 3 lb. (1.36 kg.). (*Failure.*)

Case 5.—Man aged 42. Very severe pain, unchanged after three days' treatment. Gastrectomy performed for duodenal ulcer. (*Failure.*)

Case 6.—Man aged 31. Pain still present after treatment but less frequent and less severe. Improvement maintained for six weeks. Weight gain, 4 lb. (1.81 kg.). (*? Improvement.*)

Case 7.—Man aged 45. Pain unchanged after seven-day course of treatment. Weight gain, 1½ lb. (0.68 kg.). (*Failure.*)

Comment.—The addition of casydrol to the customary diet led to symptomatic improvement in only two out of 12 patients despite a gain in weight in all. Co Tui reported that in 27 cases with pain as the presenting symptom hyperalimentation with "amigen" and "dextri-maltose" as the sole source of nourishment gave complete relief to all patients within 48 hours. We have been unable to confirm these results using casydrol. Casydrol and amigen are both enzymic protein hydrolysates: each gramme of casydrol yields 3.6 calories and each gramme of amigen yields 3.7 calories.

Summary

A method of clinical trial well suited to the evaluation of peptic ulcer therapy is presented.

The results of treating peptic ulcer with a commercial preparation of hog's stomach fail to support the assumption that this substance contains an anti-ulcer factor.

Treatment with a commercial preparation of protein hydrolysate was carried out by giving it as a supplement to the ordinary diet or, alternatively, by giving it intensively for a short period as the sole source of nourishment. The patients gained weight, but their dyspepsia did not improve.

We are indebted to Benger's Ltd. and Genatosan Ltd. for presenting a generous supply of casydrol and for providing information on its composition.

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The Ministry of Health states that some management committees have been making a free issue to patients of sweets or tobacco or paying pocket-money in cash in hospitals where this was established practice before the appointed day. Except in mental hospitals and mental deficiency institutions, this should now cease and patients should be expected to pay for tobacco or sweets supplied to them (i.e., bought on their behalf). Patients who have no means of their own (and no pension or benefit from the Ministry of National Insurance) may receive from the National Assistance Board a comfort allowance of 5s. a week, and such cases should, if the patients wish it, be referred to the area officer of the board. The Minister suggests also, that the committee or board might consider providing from their "free" money sweets—and pocket-money in appropriate cases—for children in their hospitals.

HYPERINSULINISM DUE TO AN ISLET-CELL ADENOMA

A CURE, WITH METABOLIC STUDIES BEFORE AND AFTER OPERATION

BY

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(From the Aberdeen Royal Infirmary)

Hyperinsulinism due to an islet-cell adenoma of the pancreas is not a common condition. From 1931, when an operative cure was first recorded by Carr *et al.*, until 1945, only 56 cases of cure had been reported (Walker and Boger, 1945). Some cases have since been recorded, but the diagnosis is occasionally missed simply because the condition is not kept in mind. In many of the published cases the initial diagnosis was wrong and the condition was confused with narcolepsy (Walker and Boger, 1945), cerebral tumour (Womack, Gnagi, and Graham, 1931), and psychosis (Lups, 1944). Sendrail (1947) discussed the history of this condition and gave an exhaustive review of the older literature.

The following case is reported because the history was the key to the diagnosis, and the standardized insulin-tolerance test of Fraser and Smith (1941) was performed. These authors standardized this test for the diagnosis of endocrinological disorders of glucose metabolism. Many writers (Fraser, Maclay, and Mann, 1938; Fraser, Albright, and Smith, 1941; Burtness, Koehler, and Saint, 1941; Sendrail, 1947) have stressed the importance of the response to insulin injection in the diagnosis of hyperinsulinism, but a search of the literature has failed to reveal a case in which the standardized intravenous test has been carried out.

Case History

A 40-year-old housewife was admitted to Aberdeen Royal Infirmary on July 19, 1947, for investigation. The history was obtained from the patient and her husband, both of whom were good witnesses.

Nine months before admission she began to have occasional periods of drowsiness in the mornings and difficulty in waking. These attacks lasted for one to two hours and she was well for the remainder of the day. Her husband noticed a change in her behaviour during the attacks: she often wandered aimlessly about the house and wept for no apparent reason. Retrograde amnesia was occasionally associated with the drowsiness.

The attacks became more frequent, and on one occasion, three months before admission, she suffered from general weakness of the legs and was unable to move her right arm. She was given a whisked egg and milk and quickly recovered. Her physician prescribed amphetamine sulphate, one 5-mg. tablet to be taken at 6 a.m. and another at 8 a.m. She took these daily for eighteen days, and during that time and for two weeks after she was free from symptoms.

Ten days before admission she had a three-hour period of amnesia with automatism. During that time she wandered outside to the washing-house, lit the boiler fire, and did a considerable amount of washing. Her husband found her in a dazed condition, with a burn of her arm and parts of her clothing charred. He took her indoors and revived her by giving her food.

For one week before admission she had periods of drowsiness every morning, but now they were more severe and lasted up to eight hours. During an attack she had never been seen to shake or go stiff, to have incontinence, or to bite her tongue. In addition to the burn she had only once fallen and hurt herself. There had been no personality change apart from the abnormal behaviour during the attacks. At no time had she had the sensation of warmth or sweating associated with the drowsiness. Her appetite, though poor, showed no change, and her weight remained constant.

There was nothing of note in the family and personal histories. She had two healthy children aged 18 and 10 years.

Physical Examination.—The patient was fairly well nourished; height, 5 ft. 3½ in. (161 cm.); weight, 9 st. 7 lb. (60.5 kg.). She was intelligent, but often her actions were of a childish nature. No abnormality was found on physical examination. Her blood pressure was 126/66. There were no masses or tenderness in the abdomen. No signs of hypothyroidism or other endocrine disorder were present. Urinalysis was negative, and neither sugar nor urobilinogen was present.

Special Investigations.—*X*-ray examination showed no abnormality of the bones of the skull. No abnormal shadows appeared in the abdominal skiagram and no abnormality of the alimentary tract was demonstrated by barium meal. In particular the duodenum was normal. The visual fields were full and the fundi normal. Fasting blood-sugar estimations were carried out from July 21 (Chart 1). The cerebrospinal fluid showed

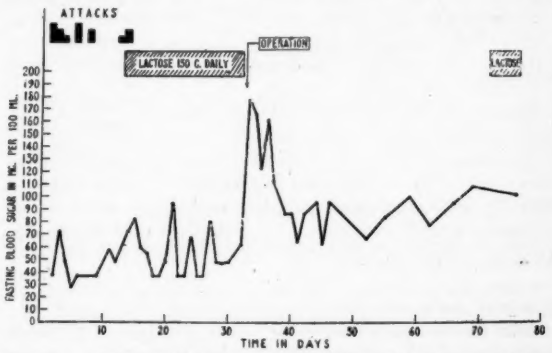

CHART 1.—Fasting blood-sugar levels before and after operation, with incidence of hypoglycaemic attacks.

no abnormality, but the sugar content was 42 mg. per 100 ml., the blood-sugar level at the same time being 100 mg. per 100 ml. The blood Wassermann reaction was negative. Blood examination showed: haemoglobin, 102%; red cells, 5,010,000; colour index, 1.02. The red cells were normal and no macrocytosis was present. Plasma chloride as NaCl was 525 mg. per 100 ml.; plasma cholesterol, 200 mg. per 100 ml. The basal metabolic rate was minus 16.

Description of the Attacks

Spontaneous.—These varied in detail from day to day, but followed the same general pattern. The patient appeared to wake normally, but soon fell into a drowsy condition and appeared to be asleep. She resisted attempts to wake her and would turn away, pull the bedclothes over her head, and curl up in bed. She showed some perseveration and repeated such phrases as "I'm all right," "I'm not asleep," and "Leave me alone." Occasionally when left alone she chattered to herself. Her speech at all times was clear. She would not carry out orders to move arms or legs or to sit up, and at times tended to be negativistic, gripping her eyes tightly when attempts were made to open them. There was no significant change in pulse or blood pressure; skin colour and temperature remained the same and at no time during an attack was sweating a feature. During the more severe attacks twitching of the facial muscles and tremors of the fingers and eyelids were seen. The pupils were dilated and reacted briskly to light. The muscles appeared hypotonic; the muscle reflexes were exaggerated, but muscle clonus could not be elicited, and the plantar responses were flexor. The attacks were quickly terminated by administration of carbohydrate, either by mouth or intravenously, without the patient's knowledge. Retrograde amnesia was present.

Induced.—Only during the insulin-tolerance test were the spontaneous attacks fully reproduced, but in addition sweating and the sensation of warmth were present. There was no retrograde amnesia after the hypoglycaemic attacks that occurred during the glucose-tolerance and insulin-tolerance tests and it was possible to elicit the following symptoms. The most constant of these were increasing frontal headache and blurring of vision. Less severe were the weakness, lassitude, and increasing hunger; the latter was present only in the glucose-tolerance tests, and may have been due to the length of the total fasting

period (eighteen hours with only 50 g. of glucose) or to the fact that meantime other patients were being fed.

Specific Investigations

Glucose-tolerance Tests.—Glucose, 50 g., was given after a twelve-hour fasting period, and blood-sugar estimations were carried out every half-hour for six hours. The blood-sugar curve during the first two hours was normal, the fasting level being reached in about that time, but all the readings were low, especially at the fourth and fifth hours. During one of these tests 0.03 mg. of adrenaline was injected subcutaneously and, though the symptoms were aggravated, there was no change in the blood-sugar level (Chart 2).

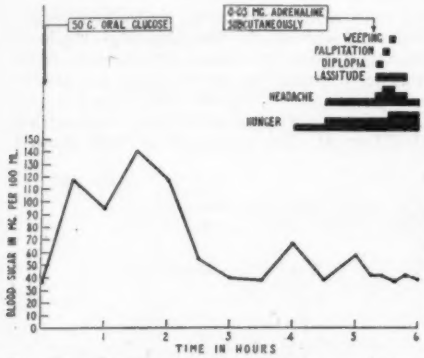

CHART 2.—Glucose-tolerance test before operation.

Insulin-tolerance Test.—This was carried out as recommended by Fraser and Smith (1941). The patient was given extra carbohydrate for four days before the test was carried out. Insulin in the dose of 3.7 units per square metre of body surface was given intravenously and the blood-sugar levels were estimated at intervals (Chart 3). Normally the maximum fall to about 50% of the fasting level occurs 20 to 30 minutes after the intravenous insulin, and by the 120th minute the blood sugar returns to within 10% of the fasting level. The index of hypoglycaemia responsiveness is a mathematical expression of the area between the blood-sugar curve as it rises from the 30th to the 120th minute level and the base-line. The more quickly the blood-sugar level returns to the fasting level the greater is this area and therefore the higher is the index. *Report*:—120th minute sample, 81% of fasting sample (normal=90–110%). Index of hypoglycaemia responsiveness, 449 (normal=470–620). *Interpretation*:—The curve shows hypoglycaemia unresponsiveness. In the absence of evidence of hypopituitarism, adrenocortical insufficiency, liver disease, or marked emaciation from anorexia nervosa this finding is suggestive of hyperinsulinism.

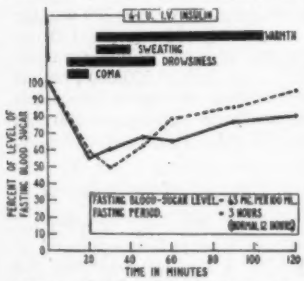

CHART 3.—Insulin-tolerance test before operation. Dotted line shows composite normal from six cases.

From the history and investigations a clinical diagnosis of organic hyperinsulinism was made and surgical treatment advised.

Operation

On Aug. 20 an operation was performed by Mr. G. Gordon Bruce. Glucose, 50 g., was given at four hours and one hour before operation. The anaesthetic used was nitrous oxide, oxygen, and ether, the latter because it tends to raise the blood-sugar level. The abdomen was opened by a right paramedian incision and the gastro-colic omentum was divided. The stomach was then hooked up by two malleable retractors and the transverse colon displaced downwards, exposing the entire anterior surface of the pancreas. At this point a bluish tumour mass about 2 cm. in diameter immediately became visible, lying slightly to the left of the midline on the lower border of the pancreas near the junction of the tail with the body of the pancreas. This lower border was freed so that the tumour could be held between the finger and thumb, a series of chain sutures of fine linen was inserted into the pancreas, and the mass was excised by cutting freely into the surrounding tissue. The gap in the pancreas was then sutured and the gastro-colic omentum closed. A soft rubber drain was left *in situ*.

Pathological Report.—"The tumour is 7 mm. in diameter and is embedded in normal pancreatic tissue. There is no true capsule to the tumour, but the surrounding pancreatic tissue is flattened and compressed. The tumour is vascular, and the cells show acinar formation. There is no evidence of malignant change. Special staining methods fail to demonstrate that the tumour cells are of the β cell type. *Diagnosis*:—benign islet-cell adenoma."

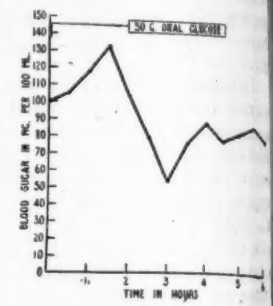

CHART 4.—Glucose-tolerance test after operation.

Post-operative Progress

There have been no more drowsy attacks, and the patient is well (sixteen months after operation). Immediately after the operation blood-sugar estimations were carried out at approximately four-hourly intervals, and after an initial rise to 187 mg. per 100 ml. and a fall to 162 mg. the blood-sugar level rose steadily to a maximum of 197 mg. at the twenty-fourth hour, though nothing but sips of water were being given. The hyperglycaemic period lasted four days and was accompanied by slight glycosuria for two days. After four days the fasting blood-sugar level fell to normal (average 86 mg. per 100 ml.). Convalescence was uneventful, apart from a small pancreatic fistula which discharged for five weeks.

Forty days after operation the following tests were carried out:

Glucose-tolerance Test.—This showed a normal response, although at the third hour the blood sugar fell to a low level (Chart 4).

Insulin-tolerance Test (Chart 5). — *Report*: — 120th minute sample, 92% of fasting sample. Index of hypoglycaemia responsiveness, 488. *Interpretation*: — Curve shows: insulin resistance (maximum fall in blood sugar delayed beyond thirty minutes after intravenous insulin), and normal hypoglycaemia responsiveness.

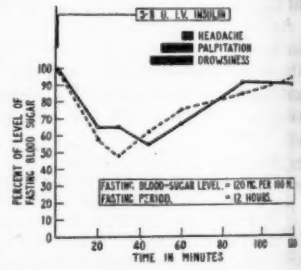

CHART 5.—Insulin-tolerance test after operation. Dotted line shows composite normal from six cases.

Discussion

The present case illustrates the steps by which a diagnosis of organic hyperinsulinism can be arrived at, first by the demonstration that the patient's symptoms are due to spontaneous hypoglycaemia, and then by the elucidation of the special features that distinguish organic hyperinsulinism from other causes of spontaneous hypoglycaemia.

Of the three main causes of spontaneous hypoglycaemia mentioned by Conn (1940)—hepatogenic hypoglycaemia, functional hyperinsulinism or cryptogenic hypoglycaemia (found in persons of unstable personality and almost always associated with psychoneurotic symptoms), and organic hyperinsulinism from an adenoma or carcinoma of islet tissue—the first two could be excluded. There was no clinical evidence of hepatic insufficiency and the glucose-tolerance test did not show the high plateau curve characteristic of liver disease. The intolerance to fasting, with hypoglycaemic blood-sugar levels, the lack of correlation of the attacks with previous ingestion of a carbohydrate meal, and the patient's stable personality before the onset of the

present attacks excluded the condition of cryptogenic hypoglycaemia.

The occurrence of hypoglycaemia unresponsiveness in the insulin-tolerance test, with restoration of a normal response after removal of the islet-cell adenoma, indicates a causal relationship and affords confirmation of the suggestion of Fraser, Albright, and Smith (1941) that organic hyperinsulinism would be expected to produce hypoglycaemia unresponsiveness in the insulin-tolerance test.

This case is typical of the cases of islet-cell adenomata already reported and illustrates many points. It shows the successful results of surgery in hyperinsulinism due to islet-cell adenomata. Medical treatment is indicated in cryptogenic hypoglycaemia but is dangerous in organic hyperinsulinism. A high-carbohydrate diet tends to fatten the patient and so makes for a poor operative risk later. Repeated prolonged hypoglycaemic attacks can cause permanent damage to the central nervous system. These tumours show a tendency to become malignant and there should be no delay in attempting operation.

From this case it would appear that the coma, muscular twitches, and altered behaviour—equivalent to Himwich's (1944) cortical and subcortical phases of hypoglycaemia—were due to the low blood-sugar level. The symptoms such as lassitude, headache, and visual disturbances would seem to be due to adrenaline secretion reflexly induced by a sudden fall in the blood-sugar level. The small dose of adrenaline given during the glucose-tolerance test seemed to aggravate the symptoms of hypoglycaemia without altering the blood-sugar level. This case also showed that amphetamine sulphate could temporarily relieve the hypoglycaemic attacks, presumably by raising the blood-sugar level.

A short post-operative period of hyperglycaemia has been found in cases in which blood sugars have been estimated. This would appear to be due to the partial depression of the activity of the normal islets, while the requirements of the body were covered by the adenoma. The insulin resistance after operation may be due to persistence of a high level of the insulin antagonists, such as the glycotropic factor of the anterior pituitary.

Finally, the case illustrates the great importance of accurate differential diagnosis in cases of spontaneous hypoglycaemia, the difficulty of attempting to diagnose hyperinsulinism by the glucose-tolerance test alone unless this is prolonged for several hours, and the value of the insulin-tolerance test in diagnosing organic hyperinsulinism.

Summary

A case of organic hyperinsulinism is reported. The condition was cured by the removal of an islet-cell adenoma. Glucose-tolerance and insulin-tolerance tests were carried out before and after operation. The usefulness of the latter in the differentiation of hyperinsulinism from other causes of hypoglycaemia is emphasized.

I wish to thank Professor John Craig for permission to publish this case, and Professor J. Young and Dr. W. M. Davidson for the pathological report. I am indebted to Dr. Ian A. Anderson for carrying out the insulin-tolerance tests and for his help and guidance so freely given.

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RINGWORM OF THE SCALP

TREATMENT BY X-RAY EPILATION WITHOUT SUBSEQUENT LOCAL APPLICATION

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The many ingenious attempts made by various schools to increase the efficiency of local treatment in cases of tinea capitis have so far been unsuccessful, and the latest report by Brain *et al.* (1948) on the effect of fungicides in penetrating bases, although suggestive, must be evaluated in the light of further experience before we can hope to dispense with epilation by *x* rays as the method of choice in these cases.

Sequeira, Ingram, and Brain (1947) state that "it must be realized that they [*x* rays] have no parasiticidal action, but are simply used to remove the hair, after which continuous treatment must be applied to the bald scalp in order to eradicate the fungus before the hair grows." Again, Becker and Obermayer (1947) say: "It is the long period between epilation and regrowth that gives roentgen irradiation a superior advantage over all other methods of epilation, for during this time the surface of the scalp can be rendered antiseptic. . . . After epilation is complete local treatment . . . is carried out vigorously until no evidence of the disease can be found."

It can be seen from the preceding quotations that *x*-ray epilation is regarded only as ancillary, and that it is the local application of fungicides that really brings about cure. The late Mr. G. Stebbing, Director, *X*-Ray Department, Lambeth Hospital, however, believed that local treatment was unnecessary, and it has been the policy at the Lambeth Clinic to treat all cases of tinea capitis by the following method.

Method

X-ray epilation is carried out by the four-field technique (four main fields and one subsidiary field), the following factors having been worked out by Dr. L. H. Clark.

Victor KX10 Apparatus.—K.V.P. 100. Half-value layer 1.6 mm. Al. Tube current 7mA. Primary volt reading 75v. (selector switch—high). F.S.D. 19.5 cm. Open field 16.6 in. (42 cm.) diameter.

Dose.—Four main fields: 500 r skin dose (backscatter factor, 1.24). Subsidiary field: 124 to 160 r according to the size of the patient's head, the average being 142 r. In very small children this, of course, is omitted.

Instructions to Patients.—The patients are simply instructed to wash the scalp with soap and warm water from the fifteenth day after treatment until epilation is complete. A cotton cap is provided by the department, and the patients are advised to make another like it. The patient wears one of these caps while the other is sterilized by boiling on alternate days.

After-care.—Inspection is carried out by the clinic about three weeks later, and thereafter as is considered necessary. Local application of ung. adipis lanae is prescribed to soften

and facilitate the removal of any scabs or scales that may be present. The occurrence of secondary infection is treated on general principles, but these cases were few in this series, which indicates the high standard of the school medical organization in detecting cases at an early stage.

With the factors given above, epilation has always been on the whole satisfactory. Occasionally small tufts of hair have remained in the centre of a well-epilated area or towards the periphery of the scalp. In most cases the hairs are loose and can be easily removed by a pair of forceps. Sometimes, however, these tufts resist extraction, but since infection of these hairs is not present, as shown from the following results, recontamination of the growing hair never follows and they can be ignored. No complications result from therapy except occasional headache and vomiting on the night of treatment, and there were no cases of alopecia, local or general.

Review of Cases

To check the results of treatment carried out on the lines described above, follow-up cards were sent to 103 patients whose epilation dated from eight months and over requesting them to attend the *x*-ray department for review. These 103 cases comprised: 71 with a laboratory diagnosis of *Microsporon audouini*, 27 with a laboratory diagnosis of ringworm fungus, and 5 diagnosed on clinical grounds and by Wood's light.

Forty-eight of these patients responded in person and were examined by us clinically and by Wood's light. They all proved to be free from infection and their hair and scalp were in excellent condition. Of the remaining 55 patients, 13 had left London and could not be contacted, and 42 were examined at their schools by the courtesy of the medical officer of the S.E. and S.W. divisions, who kindly forwarded reports on the condition of these patients. All without exception were completely well and their hair and scalp were described as being in a healthy state.

From these figures it can be stated that out of 103 patients with ringworm of the scalp who received no treatment other than *x*-ray epilation 90 (87.37%) showed no signs of relapse after an interval of time ranging from eight to twenty-four months. These 90 were made up as follows: 68 cases of *M. audouini* infection, 19 of ringworm fungus, and 3 diagnosed clinically and by Wood's light. It should be added that as no complaints have been received concerning the other 13 cases it can be assumed on fairly certain grounds that they too have remained free from relapse. This being so, the total percentage of cures may have reached 100.

Time Lost from School.—To date it has been our policy to keep the children away from school for about two to two and a half months, when the new hair showed signs of regrowth. We feel that in view of the above results an earlier return is possible, as the loss of a full term is often a serious handicap to these children. Perhaps, with a good epilation, six weeks would be sufficient in the great majority. Further work will be necessary, however, before a final decision can be taken on this point.

Summary

One hundred and three cases of tinea capitis treated solely by *x*-ray epilation are reviewed after an interval of eight to twenty-four months.

The results show that local application of fungicides is unnecessary—at least in cases of *M. audouini* infection. It may be added that the fact that the cases were consecutive and were free after the lapse of such an interval is ample justification of the view of the late Mr. G. Stebbing, who held that local treatment was unnecessary, and that although *x* rays were not parasiticidal they either had the power to reduce the vitality of the fungus or brought about some tissue change which made it less easy for chance spores remaining to contaminate the new crop of hair.

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FULMINATING MENINGOCOCCAL SEPTICAEMIA

AN ACCOUNT OF THREE CASES, WITH ONE RECOVERY

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Fulminating septicaemia is one of the rarer manifestations of meningococcal infection. It occurred in 24 (3.4%) of Banks's (1948) series of 706 cases, and American authors give its incidence as about 1% (Sweet, Dowling, and Howell, 1947).

Though it may be preceded by a few days of mild infection of the upper respiratory tract, the onset is usually sudden, with fever, rapid respirations, and cyanosis, simulating early pneumonia. Petechiae appear within a few hours, and quickly enlarge to form purpuric blotches. Peripheral vascular failure occurs early, with a rapid feeble pulse and very low blood pressure. Meningism is absent at first, but may appear terminally. In untreated cases death occurs in 24–36 hours. Necropsy often reveals adrenal lesions, the most striking of which is massive bilateral haemorrhagic destruction (sometimes known as the Waterhouse–Friderichsen syndrome).

Since 1940, reports of successful treatment with sulphonamides and adrenal cortical extract have been published. With the additional help of penicillin Banks (1948) believes 50% of cases may recover.

We saw three sporadic cases within a year at a genera hospital. One of these recovered.

Case 1

A female laundry worker aged 21 was quite well till 2.30 a.m on Jan. 27, 1946, when she awoke with pains in her legs, whic grew rapidly worse and spread to her whole body. Her throa became sore, and during the morning dark blotches appeare on her trunk and limbs.

She was admitted to hospital at 3.30 p.m., and was seen t be a well-built woman, gravely ill. The temperature wa 102° F. (38.9° C.), pulse 112, and respirations 24. Purpuri blotches involved the face, neck, trunk, and limbs, and also th buccal mucous membrane and conjunctivae. The pulse wa rapid, feeble, and regular. Blood pressure was 75/55. Ther were no signs of meningism and the urine was normal. Whit blood cells totalled 15,000 (83% polymorphs). Bleeding an clotting times and capillary resistance were normal.

Her condition deteriorated rapidly, the pulse became imper ceptible, and the blood pressure too low for estimation. Sh sank into a coma, and a trace of neck rigidity was noted. Th pupils were irregular and the limbs flaccid. At 5.15 a.m. nex day the cerebrospinal fluid was turbid. Cells numbered 13,00 (99% polymorphs). Gram-negative intracellular diplococ

were found in deposit. Culture was sterile. She died at 6.40 a.m., 28 hours after the onset.

Necropsy was performed by Dr. D. J. O'Brien five hours after death. Widespread partly confluent intracutaneous haemorrhages from pin-point size to 15 cm. diameter were seen. There was thin pus over both cerebral hemispheres, but not at the base of the brain. Petechiae were present in parietal and visceral pleura, pericardium, and peritoneum. A small fleshy thymus gland was found. The spleen was twice the normal size. The right suprarenal was congested; the left had small haemorrhages in the medulla. No lesion of the muscles was noted.

Microscopical Examination.—The thymus was normal. The adrenals showed congestion of all capillaries but no frank haemorrhage. Cells of outer layers of cortex of both glands appeared necrotic. Diplococci were seen in films of the pus over the brain, and meningococci (Type I) were cultured from the heart blood.

Death was considered to be due to fulminating meningococcal septicaemia.

Case 2

A boy aged 3 was taken ill at midday on Oct. 11, 1946. At 7 p.m. he was febrile and breathless, and was sent to hospital as a case of early pneumonia.

On admission at 10.30 p.m. he looked severely ill, with grey cyanosis. The temperature was 104° F. (40° C.), pulse 160, and respirations 44. There was a trace of neck rigidity. The lungs were normal. A petechial rash was seen on the upper part of the trunk. During the next hour this rash developed with great rapidity until the whole trunk and limbs were covered with purpuric blotches. A clinical diagnosis of fulminating meningococcal septicaemia was made, and courses of penicillin, 30,000 units intramuscularly three-hourly, and oral sulphadiazine, 1 g. followed by 0.5 g. four-hourly, were begun. C.S.F.: crystal-clear; pressure, 120; no cells; protein, 20 mg. per 100 ml.; no organisms seen; culture sterile. Penicillin, 15,000 units, was injected intrathecally.

At 8 a.m. on Oct. 12 his condition was obviously much worse. The temperature was 106° F. (41.1° C.), pulse uncountable, and respirations 72. Blood pressure was too low for estimation. Neck rigidity was definite and Kernig's sign positive. C.S.F.: turbid; pressure, 140; cells, 3,200 per c.mm. (99% polymorphs); protein, 180 mg. per 100 ml.; no organisms seen; culture sterile. Penicillin, 15,000 units, was injected intrathecally. White blood cells numbered 33,000 (polymorphs 80%). Scrapings from a purpuric patch were cultured, but pathogenic organisms were not isolated. It was now thought that acute adrenal insufficiency might well have developed, and though the child appeared moribund it was decided to try the effect of administering adrenal cortical extracts (22 hours after the onset). The possibility of the cellular reaction in the C.S.F. being the result of previous intrathecal penicillin was also considered.

At 10 a.m. desoxycortone acetate, 5 mg., was injected intramuscularly. An intravenous infusion of 5% dextrose in normal saline was set up, and three-hourly intravenous injections were given by the infusion tubing of: 2.5 ml. of "eucortone"; 0.1 ml. of 1 in 1,000 solution of adrenaline hydrochloride; and 0.5 g. of soluble sulphadiazine. At 2 p.m. the temperature was 99.4° F. (37.55° C.), pulse 120, and respirations 48. Very great improvement was obvious. His colour was rosy, the pulse was easily felt, and the blood pressure was 100/60. Mild neck rigidity and Kernig's sign were still present.

On Oct. 14 there was no return of peripheral vascular collapse. A trace of oedema of hands and feet was present, which was considered to be due to excess of adrenal cortical extract and saline. Infusion and eucortone were therefore discontinued, after totals of 4 pints (2.3 litres) and 45 ml., respectively. Sulphadiazine, 0.5 g. three-hourly orally, and intramuscular penicillin were continued. On Oct. 16 progress was satisfactory, with only a trace of neck stiffness. C.S.F.: clear fluid, sterile; pressure, 180; cells, 360 (99% polymorphs); protein, 35 mg. per 100 ml. On Oct. 18 the purpuric patches were fading, but seven of the large ones on the back and buttocks were sloughing. Chemotherapy was stopped after a total of 1,180,000 units of penicillin and 33 g. of sulphadiazine had been given.

Convalescence was delayed by infection of the sloughed purpuric patches and of the infusion wound, but this responded to a further course of penicillin.

In May, 1947, he was quite normal for his age, the only sequelae being the scars of his infusion wound and sloughs. A radiograph of his abdomen showed no evidence of calcification of the adrenals.

Case 3

A schoolgirl aged 15 was well till Jan. 26, 1947, when she complained of a cold in the head. At bedtime she felt "shivery" and had an aching pain in the right shoulder and arm. At 1.30 a.m. on the 27th she vomited, and at 5.30 a.m. her parents observed her breathing to be rapid and shallow. She talked incoherently in her sleep. At 10.30 a.m. a rash appeared on the face and limbs consisting of "black spots which rapidly enlarged into blotches." At 2 p.m. the temperature was 102° F. (38.9° C.) and respirations were rapid. A purpuric rash was present on the face, neck, and limbs. There was no neck rigidity. Admission to hospital was requested.

On admission at 6 p.m. her temperature was 100° F. (37.8° C.), pulse imperceptible, and respirations 40. She was conscious and rational and complained only of pain in the right shoulder and weakness. Purpuric blotches and petechial spots were seen on the face, neck, arms, and legs, but not on the trunk. The heart sounds were faint—the rate was 140. The blood pressure was unobtainable. The lungs and abdomen were normal. There was dubious neck rigidity, Kernig's sign was not obtained, and the reflexes were absent.

A diagnosis of fulminating meningococcal septicaemia with adrenal haemorrhages was made, and 10 ml. of adrenal cortical extract was injected intramuscularly. Owing to the peripheral vascular collapse it was impossible to administer this intravenously; nor was it possible to obtain blood for culture and biochemical examination. Immediate preparations were made to set up an intravenous saline infusion and to begin therapy with penicillin and sulphadiazine. At 6.45 p.m., however, 20 hours after the onset of the disease, she died, remaining clear-minded to the end.

Necropsy was performed by Dr. Raeburn 20 hours after death. The body was that of a well-developed girl with an extensive purpuric rash on the face, neck, shoulders, arms, and legs. The body was free. The myocardium was pale, soft, and swollen on section. A few petechiae were seen beneath the endocardium. The entire respiratory tract was intensely congested. The mucosa of the trachea and bronchi was bright red. The lungs were markedly congested and semi-airless; minute haemorrhages could be distinguished in the parenchyma. The whole alimentary tract was congested, with numerous subserous petechiae on the stomach and small intestine. The thyroid gland, pancreas, ovaries, and kidneys were all congested. The adrenals were congested, but there was no gross haemorrhage, and the structure of the glands seemed intact. They were no more strikingly congested than the thyroid, pancreas, and kidneys, and less so than the lungs. The thymus was large and fleshy, weighing 42 g. The leptomeninges of both the brain and the spinal cord were hyperaemic, and there was a little fibrinous exudate in the sulci. The brain substance was hyperaemic and slightly oedematous. Blood obtained from the right ventricle was cultured and a profuse growth of meningococci (Type I) was obtained. The same organism was isolated from a swab taken from the sphenoid sinus.

Histological Examination.—The adrenals showed congestion of the vessels, with a number of minute haemorrhages. The spinal cord exhibited changes typical of leptomeningitis. The thymus showed normal glandular tissue, and the kidneys, pituitary, and thyroid congestion only. The lungs showed intense dilatation and congestion of the capillaries with secondary atelectasis.

Death was considered to be due to fulminating meningococcal septicaemia.

Discussion

Banks and McCartney (1942, 1943) classify fulminating meningococcal septicaemia into an encephalitic type, characterized by mental clouding progressing to coma; an adrenal type with purpuric rashes, peripheral vascular failure, and mental clearness; and a mixed type, having some of the features of the other two. Our cases are examples of the pure adrenal type, and the clinical picture is characteristic and easily recognized. Meningococci were not recovered from Case 2, probably owing to the early administration of penicillin and sulphadiazine.

In neither fatal case was there gross destruction of the adrenal glands, though congestion was seen in both and microscopic haemorrhage in one. Williams (1942) noted the absence of gross adrenal lesions in eight out of 17 clinically typical cases, and suggested that adrenal deficiency might not be an important factor in the pathogenesis of the syndrome.

Kinsman, D'Alonzo, and Russi (1946) describe a condition of "tubular degeneration" occurring in two fatal cases, without adrenal haemorrhages. The cortical cells appeared shrunken and fat globules were absent, so that the "cords" of cells usually seen looked like tubes containing fibrinous debris. They suggest that this condition is the result of adrenal exhaustion due to increased demand for the lipoid hormone during the acute infection, and, further, that irreversible damage has not occurred at this stage.

Banks (1948) states that necropsy material from all his fatal cases showed "significant" adrenal lesions. We were impressed by the dramatic improvement which followed intravenous saline and cortical extract in Case 2. Since there was no dehydration and there had been no vomiting, it is difficult to believe that the infusion of 150 ml. of saline alone accounted for this improvement. We were convinced that the cortical extract was responsible. We agree, therefore, with Banks (1948) that, though toxic and other factors may be concerned, there is justification for regarding acute adrenal deficiency as playing a leading part in the pathogenesis of this syndrome and for treating it accordingly.

The thymus gland was found to be persistent in Case 1 and larger than normal in Case 3. In both cases it was of normal microscopical structure. A similar enlargement and persistence have been recorded by Magnusson (1934) and Holmes and Cowan (1945). The rapid course of the illness makes it evident that the enlargement preceded infection and suggests the existence of a constitutional type with a large thymus and small fragile adrenals in whom resistance to meningococcal infection is lower than normal.

When a clinical diagnosis has been made treatment must be immediately instituted for septicaemia, peripheral circulatory failure, and adrenal insufficiency.

Treatment of the Septicaemia.—The meningococcus is susceptible to sulphonamides and to penicillin. It is advisable to employ both in order to control the septicaemia as rapidly and completely as possible. Any sulphonamide can be used, but, owing to the lower risk of producing renal complications, sulphamezathine is probably the drug of choice. A blood level of 15 mg. per 100 ml. should be maintained. The initial doses should be given intravenously, and for a young adult the dosage should be 4 g. immediately and 2 g. four-hourly until facilities for control by estimation of the blood level are available. Penicillin intramuscularly in full doses should be started immediately. Case 2 received 30,000 units three-hourly, but now that penicillin is more readily available much larger doses should be employed—e.g., 250,000 to 500,000 units immediately, followed by 100,000 units three-hourly. Even with such doses it is hazardous to increase the time interval between injections, as a constant strongly bacteriostatic blood penicillin level is essential in so serious an illness.

Peripheral Circulatory Failure.—An intravenous infusion of normal saline should be set up immediately. In acute adrenal deficiency the blood volume is reduced and the blood viscosity increased by loss of sodium and water into the tissues and by excretion into the urine. Logically the infusion should therefore be normal saline rather than plasma or whole blood.

Adrenal Deficiency.—Adrenal cortical extract *B.P.C.*, or one of the proprietary preparations such as eucortone or eschatin, should be given intravenously as soon as possible. The initial dose should be 10 ml., and this should be repeated four-hourly until the systolic blood pressure is maintained above 100 mm. Hg. If the extract is not immediately available, desoxycortone acetate can be used in doses of 10 mg. eight-hourly, intramuscularly. Adrenaline hydrochloride, 3 min. (0.2 ml.) subcutaneously, six-hourly, can be given, but it is of doubtful benefit. Ascorbic acid, 500 mg. intravenously, twice daily, may be helpful. The adrenals contain much ascorbic acid, but its function is unknown, and its therapeutic use here is empirical. Vitamin K analogue—menaphthone—one 5-mg. ampoule, should be given initially to ensure a normal prothrombin level. The order of treatment should be: (1) begin intramuscular penicillin injections; (2) set up an intravenous drip-infusion of normal saline; (3) begin intravenous sulphamezathine, adrenal cortical extracts, and ascorbic acid via the infusion tubing; and (4) give adrenaline hydrochloride and menaphthone.

Summary

Three cases of fulminating meningococcal septicaemia are described. One of them, a child aged 3, recovered after treatment with penicillin, sulphadiazine, and adrenal cortical extracts.

This condition occurs sporadically as well as during epidemics, and presents as a severe illness of sudden onset, with a purpuric rash and profound peripheral circulatory failure. In untreated cases death occurs in 24–36 hours.

At necropsy, adrenal lesions are always found. Acute adrenal deficiency is probably a factor in the fatal outcome.

Diagnosis must be made on clinical grounds. Treatment should be started immediately with penicillin, sulphamezathine, intravenous saline, and adrenal cortical extracts, without awaiting laboratory investigations. If it is begun early enough there is a reasonable chance of recovery without sequelae.

We are indebted to Dr. P. Hamill, under whose care these cases were admitted to hospital, for permission to publish this report and for help and encouragement in its preparation.

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The Hospital Savings Association announces that Mr. Thomas Denman, its general secretary, retired on March 1. His early experience was in the office of a local authority, then on the passing of the National Insurance Act of 1911 he became clerk to an insurance committee. In 1919, seeking the greater freedom and flexibility of a voluntary organization, he joined the late Dr. Gordon Dill of Brighton, in founding and organizing the Sussex Provident Scheme. It was from this scheme that he developed the idea of the H.S.A. He was appointed financial secretary on its incorporation in 1922 and from the first has been responsible for all the financial arrangements. In 1939 he became joint secretary and in 1945 general secretary. His successor will be Mr. C. S. Clarke, who joined the staff in 1931 and has been deputy general secretary since 1946.

NOMOGRAMS FOR SLING AND ASSMANN PSYCHROMETERS

BY

J. B. de V. WEIR, M.A., B.Sc., M.B.

(*From the Institute of Physiology, University of Glasgow*)

In an annotation in the *Journal* (1948, **1**, 989) it was suggested that nomograms for use with the Assmann and the sling or whirling psychrometers might be welcomed, as these are the instruments of choice for the measurement of the hygrometric properties of the atmosphere with scientific accuracy. The accompanying nomograms have been designed accordingly.

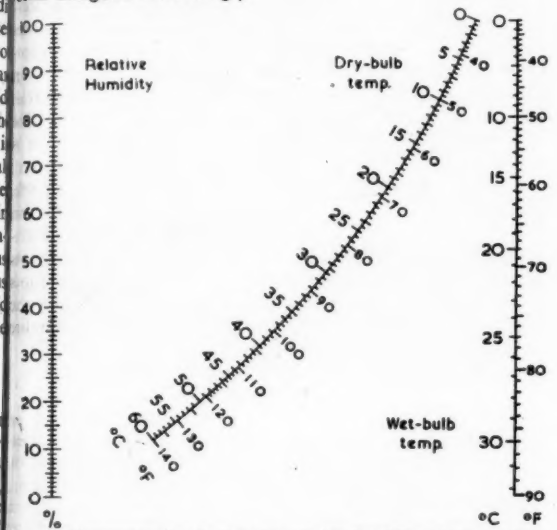

FIG. 1.—Nomogram for finding the relative humidity of the air from the dry-bulb and wet-bulb readings of a ventilated psychrometer

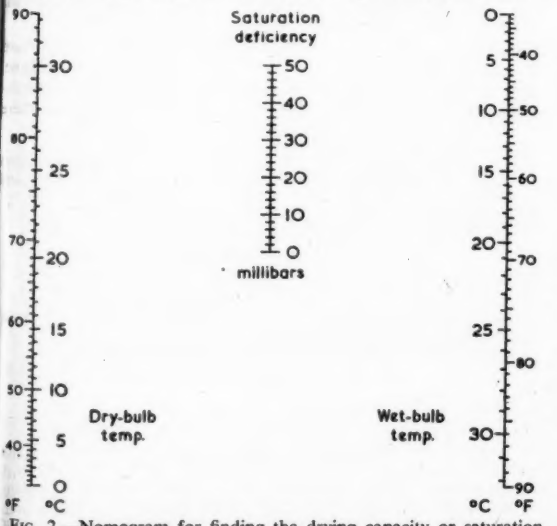

FIG. 2.—Nomogram for finding the drying capacity or saturation deficiency of the air from the dry-bulb and wet-bulb readings of a ventilated psychrometer.

To use the nomograms a stretched thread or a transparent ruler is placed so as to lie on the readings of the dry-bulb and wet-bulb thermometers; the relative humidity and the saturation deficiency can then be read off the appropriate scales.

The depression of the wet-bulb temperature below the dry-bulb temperature is sensitive to the speed of the air passing over the wet bulb for speeds up to five miles per hour, but is practically the same for all speeds beyond this (Meteorological Office, 1940). Bell and Weir (1947) have produced nomograms suitable for use in calm conditions. Ventilated psychrometers such as the Assmann and the sling psychrometer are so arranged that an air speed past the wet bulb of over five m.p.h. is obtained artificially, and so, being independent of the natural air speed, these instruments give the most reliable results.

The hygrometric properties of the atmosphere are of importance in body-temperature regulation, especially under conditions of stress such as exist in the Tropics, in deep mines, and in operating theatres (Wynne, 1947). They are also of special interest to heating and ventilating engineers and to the textile industry.

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[EDITOR'S NOTE.—It has been found impracticable to publish the nomograms here in a size that would make them really useful. They have therefore been separately printed full scale on art paper for those who are interested. Copies may be obtained from the Publishing Manager on application.]

Medical Memoranda

Ligation of the Mandibular (Inferior Dental) Artery

In deep operations on the face and the jaws preliminary ligation of the external carotid artery is not always entirely satisfactory in attaining its objective—that is to say, it does not give one a bloodless field and does not prevent venous and post-operative bleeding from innumerable oozing points; nor does it prevent the formation of a deep haematoma in a closed wound. Admittedly it controls from 50 to 75% of the bleeding, but even a remaining 25% is apt to be not only a great nuisance but a source of danger if it continues post-operatively into the mouth. Particularly is this so in the removal of sections of the mandible involving the ascending ramus.

CASE REPORT

I was faced with this problem recently in a young female patient. *X*-ray examinations of her lower jaw showed a ragged, eroded cavity in the centre of the bone extending well up into the ascending ramus above the point of entry of the mandibular artery. The bone was distended but there was no surface lesion. It looked malignant, and was getting larger fairly rapidly. (A subsequent pathological report stated that it was a malignant adamantinoma, which is what the clinical evidence and *x*-ray examination had led us to believe.)

To have obtained good access through the usual curved external incision would have involved an almost certain facial paralysis and a blind groping for the mandibular artery and vein, with a considerable probability of being unable to secure them. It was determined, therefore, to do the major part of the operation from within the mouth, and if possible to ligate the mandibular artery before it entered the lower jaw. I had reason to believe from war experience that this would not only be quite feasible but not too difficult. Search, however, failed to find any record of this ligation having been performed previously. Presumably its short course of an inch (2.5 cm.) or less from the internal maxillary artery to the foramen in the lower jaw has been regarded as inaccessible.

Operative Technique.—Operation was performed on Feb. 25, 1948, under full morphine and hyoscine premedication (Corlette system) and local analgesia (procaine and adrenaline), as follows:

1. Vertical incisions were made in the centre lines of the upper and lower lips to increase the retractability of the angle of the mouth and cheek. This procedure improves visibility and access very considerably and, anatomically and cosmetically, is preferable to a horizontal incision at the angle of the mouth.

2. Insertion of a Davis gag and opening it to the maximum extent produced a dislocation of the jaw, which served to fix it in place and also to bring the inferior dental foramen into the most forward possible position. Most of the operation was then carried out without a gag, but with medial and lateral retraction of the tongue and cheek. No packing was placed in the pharynx; continuous suction was used, and the blood remained a nice bright colour throughout.

3. A vertical incision was made through the muco-periosteum of the jaw; it extended from near the tip of the coronoid process along the crest of the alveolar ridge to the region of the first bicuspid tooth.

4. A short external incision was made along the lower border of the jaw just posterior to the mental foramen.

5. The whole of the periosteum of the jaw was stripped from the bone, except the upper part of the ascending ramus and the region of the inferior dental foramen.

6. With good retraction inwards of the internal pterygoid muscle, local illumination, and blunt dissection, the artery, vein, and nerve entering the bone were soon located, identified, and isolated.

7. A clamp was placed on the whole bundle, silk ligatures were passed above and below and tied, and division was made on removal of the clamp; there was no sign of haemorrhage, and the jaw became visible on its inner aspect right down to the angle.

8. The ascending ramus was then divided partly with a Gigli saw and partly with bone shears, about ¾ in. (1.9 cm.) below the condyle.

9. The anterior end of the bone was next divided by a saw-cut posterior to the mental foramen and the section of jaw removed. The dislocation was then reduced without difficulty. This left a fairly dry cavity lined with periosteum.

The patient's recovery was quite placid and painless. She remembers nothing of the operation, during which she slept motionless. Penicillin was given prophylactically for a few days.

In selected cases of surgery involving the ascending ramus of the jaw this procedure may prove useful. Ligation of the nerve as well as the vessels should be sound practice in view of recent experiments by M. P. Chenilleau (*Int. Abstr. Surg.*, 1948, **86**, 351), which showed that ligation of nerve-ends in animals prevented the formation of painful neuromas and also of trophic ulcers, particularly if linen thread was used instead of catgut.

I am indebted to my wife for skilful assistance. She was in fact the first to see the vessels at the foramen and to call my attention to the fact: they were even a little further forward and a little higher up than I had anticipated. I had just by-passed them on the lower side.

It is proposed to submit a fuller account of this case, illustrated by radiographs of the subsequent bone graft, for publication at a later date.

H. P. PICKERILL, C.B.E., M.S., F.R.A.C.S.
Wellington, New Zealand.

Heterotopic Pancreatic Tissue in the Ileum Causing Intussusception

Heterotopic pancreatic tissue in the wall of the ileum is rare; records of only thirteen cases can be found in the literature. Fourteen cases in which the pancreatic tissue was present in a diverticulum from the ileum are also recorded. The details of the ileal-wall cases are scanty, but intussusception occurred in three. I record a further case of intussusception caused by heterotopic pancreatic tissue in the ileum.

CASE REPORT

On Feb. 21, 1947, I was asked by Dr. J. W. Wilson, of Stirling, to see a girl aged 9½. At 2 p.m. that day she had been seized by sudden severe abdominal pain so intense as to cause fainting. The pain, colicky in nature, was felt mostly in the central abdomen and was accompanied by continued vomiting. One year previously she had had a similar but less severe attack which passed off in twenty-four hours. Examination showed slight fullness of the upper abdomen and marked tenderness and slight rigidity in the right side of the abdomen; a mass about the size of an orange was palpable to the right of and just below the umbilicus. Immediate operation was advised and the patient was admitted to Stirling Royal Infirmary.

On opening the abdomen some five hours after the onset of symptoms an ileo-ileal intussusception was found some 3 ft. (0.9 m.) up from the ileo-caecal junction. The intussusception was easily reduced. At the apex of the intussusceptum a well-defined plaque of tissue 2 by 1 cm. and some 2 mm. thick was found on the anti-mesenteric border of the bowel. This clearly had excited the intussusception. The plaque was resected, but so much narrowing of the bowel resulted from suture that it was thought wiser to resect a small segment of the ileum. This was done, and the abdomen was closed after an end-to-end anastomosis. Recovery was uneventful.

Pathological Report.—Dr. W. W. Park, of the Royal College of Physicians Laboratory, Edinburgh, supplied the following report on the specimen: "The specimen consists of a piece of compressed tissue, 2 by 1 cm. Microscopical examination shows: (1) Large masses of well-developed glandular tissue (Fig. 1) lying closely adjacent to the gut wall, and in places growing up to and even into the muscular layers. (2) The tissue is highly differentiated into acinar structures with well-formed ducts and ductules (Fig. 2). The

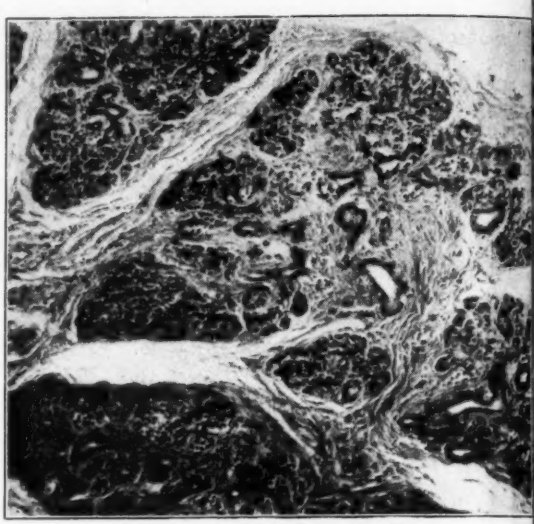

FIG. 1.—Glandular tissue. (×150.)

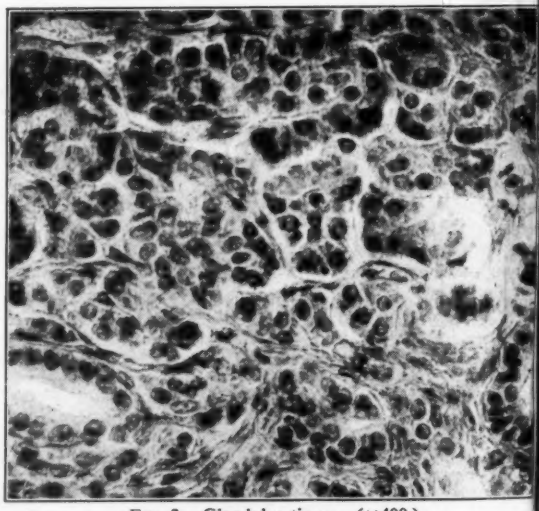

FIG. 2.—Glandular tissue. (×400.)

cell type is uniform and moderately large, and there are no mitoses. There is no evidence of malignancy. (3) This type of growth is to be regarded as a developmental error, hamartomatous in type. Conventionally, tissue of this nature is designated heterotopic pancreatic tissue, although in this case, where there is no sign of any islet tissue, it would be more correct to regard it as non-specific development or overgrowth."

I am indebted to Mr. Stanley Hay, Dr. Park's technical supervisor for the photomicrographs.

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Visiting Surgeon, Stirling Royal Infirmary.

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Reviews

CARDIOGRAPHY

Cardiography. By William Evans, M.D., D.Sc., F.R.C.P. (Pp. 132; illustrated. 25s.) London: Butterworth and Co. (Publishers). 1948.

This book gives a fully illustrated account of electrocardiographic abnormalities and of phonocardiographic tracings. Unfortunately the author dismisses the "V" unipolar precordial and limb leads as vectors (p. 2), with which in fact they have nothing at all to do (V stands for voltage). Consequently the reader will learn nothing of the principles upon which modern cardiography is based, nor of the effect upon the cardiogram of rotation of the heart on any of its axes. Left bundle branch block is described as showing "L.A.D. The QRS complexes are wide with the T wave written in the opposite direction to the QRS" (Fig. 54, etc.). This discordant type of left branch block is due merely to a horizontal position of the heart. Concordant curves, due to a vertical position, are classified as bundle branch block, though in Fig. 118 the single precordial lead given makes it obvious that the lesion is left-sided. The author includes auricular flutter among the lower ranges of the auricular tachycardias, in which the auricular rate is stated to vary from 250 to 500 a minute. If the ventricular rate is less than 200, and the extra P waves cannot be made out, they are assumed to be buried in the QRS. In auricular flutter, however, the response to carotid sinus pressure is different and the existence of a circulating wave was proved by Lewis. The author does not mention the recent suggestion that some auricular paroxysms may be due to a circulating wave with a slower rate than in flutter because the A–V node is involved in the circuit. He gives a good account of the cardiographic changes in acute pericarditis, but does not say that pathological Q waves are absent, nor why this must be so. The section on cardiac ischaemia contains much wisdom. Some of the interpretations are open to question. Fig. 23 would seem to show premature ventricular systoles; the auricular rhythm is regular and the P waves are all upright. Fig. 132 suggests a septal infarction. Q waves are not found in lead I in uncomplicated left branch block, and the T wave is "domed." Precordial leads would have helped. It is difficult to understand why the diagnosis of 2:1 heart block in Fig. 147 is rejected. Among other things the form of the T waves in lead II would be most peculiar if P were not summated with them. But these are small blemishes in a book in which the illustrations are uniformly good and well produced, and to anyone content with the older conceptions this section can be recommended as a straightforward and clearly expressed account of cardiographic abnormalities.

Sound tracings were used by Lewis forty years ago, but since then have not attracted much attention in this country. Different types of recording instruments give differing results, and there is no agreement yet on which is the more accurate. In this section the author shows records obtained with a string galvanometer and a glass rod of various additional heart sounds and of cardiac murmurs. The records are very clear and the descriptions easy to follow, but it is rather startling to learn in Fig. 192 of an inaudible murmur.

C. W. C. BAIN.

RADIOTHERAPY

The Treatment of Malignant Disease by Radium and X-rays. By Ralston Paterson, *M.C.*, M.D., F.R.C.S.Ed., D.M.R.E., F.F.R. Being a Practice of Radiotherapy. (Pp. 622; illustrated. £2 5s.) London: Edward Arnold. 1948.

Radiotherapy is a relatively new branch of medicine requiring an acquaintance with physics and biophysics which is unnecessary in other medical work. Physicians and surgeons tend to regard the radiotherapist as a kind of technician, and this indeed he must be; but he must also be a clinician who, like the general physician and the general practitioner, is concerned with all regions of the body and with problems of nutrition, relief of pain, nursing, and the innumerable ways in which cancer and the metabolism of the individual are linked. The reader of Dr. Paterson's textbook on radiotherapy gains an appreciation of these two sides of the subject—a technical knowledge of the accurate administration of radiation and insight into its effects, and also the knowledge of patients necessary to every true doctor. The author considers the technical side in great detail, but the clinical aspects form a background against which the technical points may be appreciated by radiotherapists. No one without an immense knowledge and experience of cancer treatment could have attempted such a work. While Paterson is the author of the book, he refers also to the team at the Holt Radium Institute whose work has made it possible for him to write it. He is clearly the inspiration of this team and the architect of an elaborate, extensive, and efficient organization which has already published many papers and, in the last two years, accounts of the results achieved by the methods he describes here and a book on radium dosage.

Having decided from the experience of himself and others what doses of radiation he thinks are necessary to destroy cancers and to help patients in whom they cannot be destroyed, Paterson has given details of how to administer those doses, bearing in mind the technical and clinical difficulties. He has been helped with certain chapters by other authorities. Windeyer and Roberts contribute a chapter on radium beam work; Levitt discusses the treatment of blood dyscrasias; Margaret Tod helps with the chapters on reticuloendothelial and gynaecological conditions; Dobbie teaches us a great deal about beam direction and field selection. Dr. Edith Paterson's review of the biological effects of radiation is excellent but seems to be insufficiently related to the rest of the book. Jefferson's article on tumours of the central nervous system is short but very interesting. The physics is capably dealt with by Meredith.

In his introduction the author prepares us for an account of Manchester methods based on Manchester ideas. While this gives force to the book it detracts from its value as a textbook. Calibration of apparatus, details of organization, equipment and staffing of centres of radiotherapy, the provision of isodose curves, radium charts, and lucid details in connexion with the nursing of patients are all desirable features, but some omissions strike one. For instance, the use of differentially loaded radium needles for implants and the use of radon ointment in treating necrosis are important technical advances. The heavy dosage given to the spinal cord in treating pharyngeal cancer, the insistence on treating the whole penile shaft for all penile cancer, and the dogmatic attitude to certain as yet unsettled principles of radiation biology are a few of the points one would like to argue with the author. The chapter on new radiotherapeutic agents, however, is balanced and clear.

Every radiotherapist will find the book readable and exceedingly useful. It is important that those with little experience should, as indicated by the author, realize that it is a statement of present-day Manchester principles and methods only. Radiotherapy is still a developing subject.

FRANK ELLIS.

SWISS OBSTETRICS

Lehrbuch der Geburtshilfe. By Th. Koller. Volumes 1 and 2. (Pp. 613 Vol. 1 and 1,323 Vol. 2. 110 Swiss francs.) Basle: Verlag von S. Karger. 1948.

This two-volume textbook of obstetrics forms part of "The System of Obstetrics and Gynaecology," written under the direction of Professors Anderes, Guggisberg, and Koller, of Switzerland. The publishers have maintained the exceptionally high standard for which they are well known on the Continent. The print and paper will be examined with envy by British medical authors. The excellent illustrations are derived in the main from photographs and photomicrographs, and, together with the line drawings, are a striking feature of the book.

The subject matter is of some interest, for it follows the traditional German style and contains a wealth of theory at the expense of clinical examination and operative technique. It is quite out of keeping with modern American and British

textbooks. The author has paid very little attention to original work carried out in America or Britain. This neglect is particularly striking in the chapter on implantation, and an outstanding omission is any reference to the important contributions of Caldwell and Malloy. For a modern textbook the author has emphasized puerperal sepsis too much and described foetal abnormalities in too great detail. As a standard textbook for Swiss students and practitioners the book will be held in esteem and perhaps with affection, but it is unlikely to receive much attention in either America or Great Britain.

WILFRED SHAW.

A GUIDE TO CHEMOTHERAPY

A-B-C's of Sulfonamide and Antibiotic Therapy. By Perrin H. Long, M.D., F.R.C.P. (Pp. 231. 17s. 6d.) Philadelphia and London: W. B. Saunders Company. 1948.

In this little book the author first discusses general principles and methods of administration of sulphonamides, penicillin, and streptomycin, and then the principal diseases and conditions, in alphabetical order from "abscess" to "yaws," for which they are indicated. His clear and dogmatic instructions include brief references to other forms of treatment and frequent warnings against undue reliance on chemotherapy when, for instance, surgery is also required, and against giving these drugs without adequate reason on the off-chance that they may do good.

Noteworthy features are the full discussions on syphilis and tuberculosis, the heroic system of dosage advocated for subacute bacterial endocarditis (2-hourly injections for six weeks), and the repeated warnings, because of the danger of sensitization, given against local application. He considers that the local treatment of ulcers, burns, and blepharitis with either sulphonamides or penicillin is inadvisable for this reason, which seems unfortunate. He advises the use of penicillin for controlling peritonitis due to perforating wounds but not for that produced by appendicitis, a distinction for which the reasons are not quite clear. Although in a few instances everyone may not agree with the instructions given, this book should be a useful and handy guide to the practitioner.

L. P. GARROD.

MINOR SURGERY IN GERMANY

Kleine Chirurgie. By Professor Hans Kurtzahn, revised by W. Heyn. 12th edition. (Pp. 496. M.17.50.) Berlin: Urban and Schwarzenberg. 1948.

Perusal of this book makes one feel rather sad. Here is the 12th edition of a very popular German book on minor surgery rather poorly produced and very much out of date. Though this edition has the year 1948 on the title page it might almost as well have been published ten years ago. It contains much useful information on fractures, minor operations, and the like, but shows little evidence that the far-reaching new discoveries of the last few years have reached the medical profession in Germany. It is not necessary to read far to find this out. The sulphonamides are said to be useful, but no dosage is given, and the author says of their use in erysipelas that no definite judgment can be given on their efficacy. An account of penicillin occupies thirteen lines; it is described as a drug recently developed by the Americans; about its value we are told that we must wait for a future edition for a conclusive estimation of its efficacy. No description of dosage is given nor of methods of administering it. The author does not mention it in discussing the treatment of septic infection of the fingers, or that of carbuncle, for which extirpation is said to be the best treatment. He describes old-fashioned remedies for the treatment of burns and refers to therapy by tannic acid as a recent innovation. (It was introduced in 1925.) Tannic acid is specially recommended for the treatment of burnt fingers and hands. All the recent advances in the treatment of burns are ignored. And so we could go on. In this country the chief use of this book should be to stimulate surgeons to help their brethren in Germany to learn of the wonderful new remedies of which they know so little.

ZACHARY COPE.

BOOKS RECEIVED

[*Review is not precluded by notice here of books recently received*

Proceedings of the Annual Meeting, 1948. British Medical Association. (Pp. 415. 35s., postage 1s. 3d. extra.) London: Butterworth. 1949.

The collected papers read at the Association Meeting in Cambridge last June.

Papers on Psycho-analysis. By E. Jones, M.D., F.R.C.P. 5th ed. (Pp. 504. 31s. 6d.) London: Baillière, Tindall and Cox. 1948.

In this edition nine recent papers replace some older ones.

Arterial Hypertension. By D. Ayman, M.D. (Pp. 91. 12s. 6d.) New York and London: Geoffrey Cumberlege. 1948.

A monograph reprinted from the *Oxford Loose-Leaf Medicine.*

Death in Clairvoyance. By J. Bell. (Pp. 244. 9s. 6d.) London: Longmans, Green and Co. 1949

A detective story.

Juvenile Rheumatism. By G. E. M. Scott, M.B., L.R.C.P.Ed., L.R.F.P.S. (Pp. 163. 25s.) Melbourne: W. Ramsay, Ltd. 1948.

A review of the author's experience.

The Train. By V. Panova. (Pp. 252. 9s. 6d.) London: Putnam and Co., Ltd. 1948.

A novel, translated from the Russian, about a hospital train in the U.S.S.R. during the war.

Some Common Psychosomatic Manifestations. By J. B. Murray, M.A., M.D., M.R.C.P. (Pp. 101. 7s. 6d.) London: Geoffrey Cumberlege. 1949.

An account of effort syndrome and the "low-back syndrome."

Our Plundered Planet. By F. Osborn. (Pp. 192. 10s. 6d.) London: Faber and Faber. 1949.

The author's theme is the conservation of soil fertility and the neglect of this in many countries.

Guiding Human Misfits. By Alexandra Adler, M.D. (Pp. 114. 7s. 6d.) London: Faber and Faber. 1949.

An account of the writer's experience; intended for both medical practitioners and laymen.

Hemolysis and Related Phenomena. By E. Ponder. (Pp. 398. 50s.) London: J. and A. Churchill. 1948.

A monograph on the structure and haemolysis of mammalian red cells.

Topics in Physical Chemistry. By W. M. Clark, Ph.D., Sc.D. (Pp. 738. 44s.) London: Baillière, Tindall and Cox. 1948.

A textbook for undergraduate students.

The Belsen Trial. Edited by R. Phillips, M.C., M.A., B.C.L. (Pp. 749. 30s.) London: William Hodge. 1949.

A verbatim record of the trial.

Aids to Biochemistry. By E. A. Cooper, D.Sc., F.R.I.C., A.R.C.S., and S. D. Nicholas, B.A., A.R.I.C. 4th ed. (Pp. 244. 5s.) London: Baillière, Tindall and Cox. 1948.

The book has been extensively revised for this edition.

The Mystery of Birth. By J. Oldfield, T.D., D.C.L., M.A., M.R.C.S., L.R.C.P. (Pp. 208. 12s. 6d.) London: Rider. 1948.

Discussion of many topics related to birth, sex, and heredity.

Outline of Arabic Contributions to Medicine and the Allied Sciences. By A. A. Khairallah, B.A., M.D., F.A.C.S. (Pp. 228. $2.50.) Beirut: American Press. 1946.

Annotated quotations from Arabic works; in English.

Energy and Matter. By R. L. Worrall, M.B., Ch.M., D.P.H. (Pp. 144. 10s. 6d.) London: Staples Press. 1948.

A description in plain language of some of the concepts of modern physics.

Anaemia Problems in Rheumatoid Arthritis. By F. Nilsson. (Pp. 193. No price.) Uppsala: Appelbergs. 1948.

A monograph with references.

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TRANSMISSION OF SARCOMA BY DRIED TISSUE

Cancer is so different from microbial infections that most pathologists are reluctant to accept the notion that a virus can be its cause. No one any longer disputes that some tumours are caused by viruses: first, there are various sarcomata and other connective tissue tumours of fowls; there is an adeno-carcinoma of frogs; there is Shope's papilloma of cottontail rabbits and the cancers derived from it; and finally there is Bittner's milk factor, which plays an essential part in causing mammary cancers in inbred mice and has all the properties of a virus. Towards these virus tumours pathologists take up one of two attitudes. Most of them regard them as exceptional growths, zoological curiosities. They feel that all cancers need not have the same aetiology: some are induced by carcinogenic hydrocarbons, some by *x* rays and other physical agents, some by parasitic worms, most by as yet undefined causes—and a small minority by viruses. The other, much smaller, school of thought, led by Rous in America and Gye in this country, emphasizes an important difference between the part played in tumour causation by a virus and by hydrocarbons and other agents. The hydrocarbon determines the onset of the tumour, but is then no longer essential for its continued growth, while the virus remains in the cancer cell and is apparently the driving force constantly imposing upon it its malignant conduct. The Rous fowl sarcoma, in Boycott's words, "has been provided for our learning and pushed under our noses by Providence," and "we should not be too shy of drawing conclusions from such . . . examples."[1]

The core of the whole argument is this: Are the filterable tumours things apart, or are they essentially the same as other tumours, differing only in some quantitative manner, so that our techniques just fail (as they sometimes fail even with fowl tumours) to reveal a continuing cause separable from the living cell? In an Imperial Cancer Research Fund Lecture delivered at the Royal College of Surgeons on March 22 and published as the opening paper in this issue, Professor W. E. Gye, F.R.S., has sketched the historical background of this side of cancer research. He has shown how attempts to find a continuing cause for malignant growth within the cells of most cancers have failed again and again, until most workers believe that no such separate entity exists and that cancerous growth is nothing but abnormal behaviour imposed permanently upon the cell by some event in the past. He then puts forward evidence, even finding clues in work done as far back as 1907, that the propagation of experimental tumours need not always depend on the transplantation of intact cells. The malignant transformation of the stroma of transplanted carcinomata has been long known; one possible explanation has been the transfer of an agent from the malignant cells to those adjacent to it. Successful transplantation with tumour tissue frozen at −10° C has been known for forty years and has been attributed to the cancer cells' tenacity of life. Similar results can be achieved with tumours frozen at −79° C., but this fact is not nearly so remarkable as the results obtained at −10° C. At that temperature, Professor Gye points out, water crystallizes out but salts do not, and the cell is in fact pickled in strong brine. More recent work shows that suspensions of tumour cells survive in 40% glycerin or 40% glucose.

In contrast to all this are normal embryonic cells; their viability can be tested, for they continue to live as grafts in individuals of a similar inbred stock. It turns out that they are not remarkably tenacious of life, for they die after less than an hour at −79° C. Here are a number of straws pointing one way; but we lack certainty. It may be that cancer cells can withstand freezing, pickling, and other maltreatments which no ordinary cell would be expected to stand. Though histological study of long-frozen tissue reveals no intact cell, there is the chance that an odd cell has eluded observation, and, after all, trypanosomes can survive at −76° C.

But now Professor Gye and his colleagues take a step further, for they have transmitted three mouse sarcomata by means of dried tissues. It is far harder to believe in the survival of dried mammalian cells than of those merely pickled or frozen. It is known that bacterial cells can survive drying indefinitely, but their organization is very different from that of the cell of a mammal. Transmission of the Rous sarcoma by dried tissue is, along with filterability, the convincing piece of evidence that the transmitting agent is a virus. Two things have made possible the new success in a field where failure has for years beset many investigators. First, Dr. James Craigie has improved the technique of drying by the use of an apparatus of which a description is reported to be in the press. Secondly, it has been found, very surprisingly, that tumour tissue which has been frozen for some time and then dried can still reproduce a tumour on injection, while tissue dried while fresh will be inactive or at any rate much less potent. Professor Gye does not go deeply into the reason for this remarkable finding, though he suggests the possibility of gradual denaturation of an inhibitor at low temperatures. From all this work he concludes, "It is no longer justifiable to put the . . . filterable tumours of chickens in a separate class. . . . This work has now brought tumours of mice . . . into the same class. They have a continuing cause, and . . . probably it is viral in nature."

The question will be asked, "Do the facts justify this most important conclusion?" While it is probably the right one, the issues at stake are so important that the evidence must be completely convincing. It is to be hoped that future developments in this work will provide the answer to three questions: Is it reasonably certain that frozen, pickled, and above all dried tumour tissue does not contain any living mammalian cells at all? Secondly, are the results with these three sarcomata applicable to sarcomata generally? Two of the three which have now been dried

[1] *Proc. R. Soc. Med.*, 1928, **22**, 55.

are sarcomata derived from malignant transformation of the stroma of epithelial tumours, and therefore perhaps more likely than the average to yield evidence of a cause separable from the cells. The third is, however, a sarcoma induced by methylcholanthrene; there is, therefore, particular significance if evidence of a virus can be found in it. The finding of a single mouse sarcoma resistant to drying would not be fundamentally important—it could be dismissed as yet another zoological curiosity. Discovery of a general principle applicable to many or all mouse sarcomata would be another story. Are three successfully dried tumours so very much better than one? Thirdly, can epithelial tumours, too, be transmitted with dried tissue? It will be recalled that as yet no carcinoma of the fowl has been successfully dried or filtered—most of them cannot even be transplanted.

Suppose the answers to these three questions turn out affirmatively and we can safely accept the conclusion that tumours in general can be propagated in the absence of viable tumour cells, where does this lead? It leads certainly to the biggest advance in cancer research for many years. It means that of current theories of the nature of cancer some 90% can be quietly relegated to the waste-paper basket, leaving investigators free to concentrate on a much more limited field through which certain obvious paths are clearly indicated. The new work does not, of course, throw light on another controversial question briefly mentioned at the end of Professor Gye's lecture—are tumour viruses of intrinsic or extrinsic origin?

Professor Gye is due to retire this summer from the directorship of the laboratories of the Imperial Cancer Research Fund. His successor, Dr. James Craigie, F.R.S., much of whose work has lain hitherto in fields other than cancer, has been a very active partner in the recent research and will be able with his colleagues to continue the work of opening up this fruitful discovery.

DELAYED ADMISSION TO HOSPITAL

About a year ago we published an article by Dr. Richard Asher on the dangers of going to bed. It will not be long before we are asked to publish an article on the dangers of not going to bed, if the present difficulties experienced by general practitioners all over the country in securing admission of urgent cases to hospital continue. The situation has become so serious in London, for example, that the Local Medical Committee, having considered a confidential report of a meeting at the Ministry of Health, passed a resolution deploring such delay and stating the deep concern of the Committee about "reports which reach it of many patients who have died whose lives might have been saved had energetic action been taken to secure medical and nursing attention for them at the time when practitioners endeavoured to obtain their admission to hospital."[1] One of the cases that prompted the Local Medical Committee for London to take action was that of a man with chronic tuberculosis suffering from retention of urine. When the medical man in charge of this case asked the Emergency Bed Service to see that the patient was admitted for the treatment of retention of urine he was told that the E.B.S. could not do this because tuberculous cases were the responsibility of the tuberculosis officer of the appropriate hospital board. The doctor, less concerned with administrative finesse than with the welfare of his patient, refused to accept this decision, and so the E.B.S. referred the matter to a medical officer of the Regional Board, who "confirmed that this was a case for the tuberculosis officer and not one that could be forced into hospital regardless of the tuberculosis, as a matter of life and death." The E.B.S. then inquired whether the patient's local hospital would admit him as was once more met with the objection that the matter should be referred to the tuberculosis officer. The doctor in charge of the case finally found a hospital in which the patient could be treated. A correspondent informs us that at 9 o'clock one evening he asked the E.B.S. to arrange for the admission of a patient with a perforated duodenal ulcer. At midnight he was informed that 10 hospitals had been tried but that no bed was available. He visited his patient twice during the night, and when the unfortunate man was finally admitted at 10 a.m. the next morning he was in bad condition. Our correspondent adds: "I have been in general practice for 28 years and have never had before July 5, 1948, an experience of this kind." It appears that these are not isolated cases but that the difficulty of getting acute cases into hospital is being experienced by practitioners throughout the country. It is impossible to estimate the size of the problem, but necessary to emphasize that it exists. It is indeed a paradox that a hospital service available for the whole community under the National Health Service Act should in many cases fail at the point where hospital treatment may be a matter of life or death. If this sort of thing had happened before July 5, 1948, it would have been called a scandal and attributed to the faulty organization of the hospital services. There are probably many factors at work which make it difficult to get patients into hospital, but the principal obstacle is that no one now has the authority to insist that an acutely ill patient be immediately admitted to hospital.

From the time of Queen Elizabeth to July, 1948, the destitute sick were in the privileged position of having beds available for hospital treatment. Under the Local Government Act of 1929 local authorities were allowed with permission of the Ministry of Health to appropriate poor law hospitals as public health hospitals, and as a result a municipal hospital service evolved, the outstanding example of which was that under the control of the London County Council. Under the Poor Law the Relieving Officer had the authority to request admission to a poor law hospital of anyone coming under the definition of destitute sick or urgently ill. The Ministry of Health made it a condition for appropriation under the Act of 1929 that the public health or municipal hospital should incur the same obligation as under the Poor Law to admit urgent cases, and the Relieving Officer was given the responsibility of insisting upon the admission of an urgent case into the municipal hospital. Under the N.H.S. Acts no one below the Minister of Health has the power to require a hospital to admit a sick person. So we have the curious situation in which a privile

[1] *British Medical Journal Supplement*, 1949, 1, 120.

enjoyed by the destitute sick since the time of Queen Elizabeth till July 5, 1948, is now not available to them in a universal hospital service open to all. In relation to the needs of the acute sick the State Hospital Service in London is less efficient than the hospital service previously administered by the London County Council. If the Minister of Health is to fulfil his promises to the public it is imperative that he should see that the old obligation to admit acute cases is restored—and quickly.

It is true that the hospital service generally is suffering from a grave shortage of nurses, reflected in the fact that wards have had to be closed. It is possible that more persons are now seeking hospital treatment, but it is also true that before July, 1948, any hospital, however hard-pressed, always managed to find room for someone in need of life-saving medical or surgical treatment. In London an Emergency Bed Service was established in 1938 to give the practitioner immediate information on the availability of beds. The E.B.S. has not the authority to compel admission. No doubt it is now hard-pressed with requests, but it is permissible to question whether conditions allow it to operate at full efficiency. Practitioners complain that the E.B.S. does not have at any one moment an up-to-date statement of bed vacancies in London. They complain, too, that during the evening and night hours the E.B.S. tends to be of little use. In other words its service seems to be least efficient at the time when the general practitioner experiences the greatest difficulty in securing admission for acutely ill patients. Another possible cause of delay is the establishment of urgency. Any doctor may make a mistake in diagnosis, but the establishment of urgency cannot be done by a clerk who takes down over the telephone details of the frequency of pulse and respiration and of temperature. The place to establish urgency should be at the hospital, and until he or she gets there the patient should be given the benefit of the doubt. But the urgent need is for the quick re-establishment of authority to secure the immediate admission into a State hospital of an acutely ill person.

HOW OFTEN ARE WE ILL?

With the introduction of the National Health Insurance Act of 1911 it was held that valuable records for research would accumulate from the doctors' certificates of incapacity. In fact extremely little was ever done with this potential source of information on the incidence of illness in the working population except, later, in Scotland, where the Department of Health, with a smaller and more manageable number of records, published valuable analyses annually for several years before the war of 1939–45. In England and Wales brief references to the frequency of different diagnoses were for a time made in the annual reports of the Chief Medical Officer of the Ministry of Health, and important pioneer studies of sickness in particular industries, based upon insurance certificates, were issued by the Industrial Health Research Board. No analysis was ever made of the full national records, and it was frequently argued that the diagnoses were not sufficiently accurate to justify such a task. Such arguments might equally well have applied to the analysis of the early death certificates of 100 years ago—some, no doubt, would say of to-day, too. But it is only through the continual use of the death records as a measuring rod in public health and preventive medicine that the certifying doctor has come to realize the importance of as accurate a diagnosis as he or she can give.

If sickness certificates are similarly valuable measures of the state of the public health—and it is known that they are being analysed for that purpose—there is no reason to doubt that the general practitioner will co-operate, as in registering deaths, by giving as precise a diagnosis as is possible. The system, too, has one great advantage to the busy doctor. Most requests, or demands, for statistics to-day inevitably mean yet another form to fill in. Under the National Insurance Scheme the certificate of sickness has already to be provided, and statistics of the "nature of the illness" suffered by the population and the frequency of different illnesses will merely come out as a by-product. Thus the only plea made by Dr. A. Massey, the Chief Medical Officer to the Ministry of National Insurance, in outlining the Ministry's plans in a statement published in this week's *Supplement* is for an accurate diagnostic statement—except, he recognizes, in the few cases where in the interests of the patient it cannot be done.

In this new study of morbidity the final medical certificate is the one to be used. The Ministry foresees from a working population approaching 25 millions some 7 million claims for sickness benefit a year and about three-quarters of a million claims for industrial injury benefit. It would be very wasteful of man-power and energy to analyse these huge numbers, and in accordance with modern statistical thought it is proposed to take appropriate samples. Every claim to benefit under the Acts, made in the first instance to a local office in any part of the country, has to pass promptly to the Ministry's vast record office in Newcastle. Here the claimant's "insured state" is checked and the appropriate reply returned to the local office. At some point in the ceaseless flow of these documents through the Newcastle office the final medical certificates must day by day be tapped and a representative sample drawn off. The data will then be analysed by means of punched cards and mechanical sorting to give particulars of the illnesses experienced by men and women of different ages, employed in different jobs, and living in different localities. Different times of the year are not mentioned, but this, one may hope, will also be brought into account. Short sicknesses will, of course, be seldom included, since often no claims for these can be made. Such sickness statistics, too, will present many other difficulties in interpretation. For instance, it is very unlikely that persons in the upper social classes will trouble to claim benefit at all when they are ill for a short time; thus their sickness experience will be understated, perhaps quite considerably. Until the next census—due in 1951—the numbers of persons at risk in local areas and in different occupations will be unknown, so that the required sickness rates will be lacking and only those decidedly second-best indices—proportional rates—can be calculated. But in spite of imperfections and difficulties—some merely temporary—the collection and analysis of these morbidity data, which started on Jan. 1

this year, are clearly well worth while—at the very least on the experimental basis on which Dr. Massey places them. The results of the experiment will be awaited with interest.

CHILDREN'S CARDIAC CLINICS

Cardiac clinics to which children suspected of heart disease can be referred for an accurate assessment of their true condition serve a most useful purpose. In a paper appearing elsewhere in this issue Dr. R. Kemball Price describes the working of such a clinic during its first eighteen months and points out not only how it helps the individual child but also how it aids the accumulation of knowledge of heart disease. "Innocent" or "functional" murmurs are particularly common in children, and unless their nature is recognized there is a serious danger that a child's activities may be unnecessarily curtailed, with the development of a cardiac neurosis as a possible result. Further, it is too infrequently realized that most children with inactive rheumatic heart disease and acyanotic congenital heart disease need not lead restricted lives.

Unless active rheumatic infection is present children with minor lesions of rheumatic heart disease have no symptoms, and they suffer no ill effects from being allowed to lead a full, normal life. In the case of the rheumatic child, as of the child with a healthy heart and a functional murmur, unnecessary inactivity may easily lead to needless cardiac invalidism. In fact, of Dr. Kemball Price's first 200 cases 96 had already had their activities restricted on medical advice before being seen at the clinic, and in only 15 was such restriction found necessary. Thus 81 children of the 200 referred to the clinic had suffered needless and unhealthy limitation of their activities. It is equally important that when rest is indicated children's lives must be suitably rearranged, and it is noteworthy that of the 37 children found to have rheumatic heart disease 6 had active rheumatism. While the clinic will not often find it necessary to limit the activities of a child with inactive rheumatic heart disease there is a very important service to the patient which it should perform—that is to advise on suitable occupations. As Dr. Price points out, it is difficult for a man in his thirties to change from manual work to something less strenuous, but it is relatively simple to select a sedentary occupation at the time of leaving school.

Children's cardiac clinics can be expected to provide new information on the incidence of organic heart disease, on "innocent" murmurs, audible third heart sounds, and other abnormalities. Dr. Price, for instance, found more cases of congenital than of rheumatic heart disease. While no closely comparable figures are available for large cities in this country there can be little doubt that in a completely urban area there would be a far larger proportion of children with rheumatic heart disease. This is certainly so in the United States, where, for example, Weiss[1] in Louisville found 69% of all organic heart disease in children to be rheumatic in origin, and Rauh[2] in Cincinnati reported a figure of 55%. In neither of these areas is rheumatic fever regarded as prevalent. There has been and still is considerable difference of opinion about the incidence of uncomplicated congenital pulmonary stenosis, perhaps the most extreme view being that of Taussig,[3] who considers it one of the rarest types of congenital heart disease. However, in Dr. Price's series physical signs suggesting this diagnosis were common.

Much useful information can be obtained by keeping these children under close observation for many years. This will provide not only a check on the accuracy of the original diagnosis but also information, which at present is lacking, about the disappearance of the "innocent" murmur, so much less commonly found in adults than in children. In addition there is still much to learn about the prognosis of both congenital and rheumatic heart disease. In the case of the latter the results of some long-term studies similar to those envisaged at Brighton by Price are now available. For instance, Ash[4] has reported from Philadelphia the follow-up of 547 children for 10 years after the onset of the rheumatic infection. Of the 318 children with signs of heart disease at the end of the initial attack 42% had died within ten years; but on the other hand 30 of the children had lost all signs of cardiac abnormality. Of the 219 children with no clinical evidence of heart disease after the first attack only 5% died of heart disease in the 10-year period, and over three-quarters continued to have no abnormal signs. Nearly a quarter of all the children included in this study died of rheumatic infection within 10 years of the onset. Wilson and Lubschez[5] in New York have carried their survey further, having followed up 89% of 1,042 rheumatic children for an average of 14.8 years. Their results were rather better than those of Ash, since only 194 of the patients died of heart disease during the period of observation. Wilson and Lubschez calculate from their figures that a child affected with rheumatic fever has four chances out of five of living for 15 years after the onset, and a one-in-two chance of surviving to the age of 40.

Many more such observations as these from different regions are clearly desirable, and there is a need for similar studies of congenital heart disease now that operative treatment is available for some malformations. All too little is known of the natural history of congenital heart disease, yet such knowledge is essential for the proper assessment of the risks of operation compared with those inherent in the defect itself.

[1] *Amer. Heart J.*, 1941, **22**, 112.
[2] Ibid., 1939, **18**, 705.
[3] *Congenital Malformations of the Heart*, 1947. The Commonwealth Fund, New York.
[4] *Amer. Heart J.*, 1948, **36**, 89.
[5] *J. Amer. med. Ass.*, 1948, **138**, 794.

EXOGENOUS HAEMOCHROMATOSIS

The term haemochromatosis, or "bronzed diabetes," normally calls to mind a rare and little understood condition in which large quantities of iron are deposited in the tissues—notably the skin, liver, pancreas, and abdominal lymph glands, though few organs escape. Varyingly ascribed to an inborn error of metabolism,[1] to copper poisoning,[2] and more recently to some nutritional deficiency,[3] it affects males 20 times as frequently as females and is commonest between the ages of 45 and 55. The reasons why iron should accumulate in the body are not known, which is not surprising in view of the lack of information about the normal metabolism of iron. Until recently, for example, it was believed that iron was absorbed by the small bowel and excreted by

the colon and, in very small amounts, in the urine and bile. This belief is no longer tenable, since it is now clear that iron in the faeces represents merely the unabsorbed residue of the food iron. Recent work[4] appears to show that the intestinal mucosa in some way controls the absorption of iron according to the needs of the body. Apart from loss of blood—e.g., by menstruation—there is no way in which iron can be eliminated in appreciable quantity,[5] and this may help to explain why "endogenous" haemochromatosis is so much commoner in males.

Many unsuccessful attempts have been made to produce haemochromatosis in animals by the administration of large quantities of iron. Polson[6] gave large amounts of dialysed iron subcutaneously or intraperitoneally to rabbits over periods of several years, and despite the accumulation of enormous quantities of iron in the liver no fibrotic changes occurred in this organ or in the pancreas. Cappell[7] injected colloidal iron intravenously in mice and found that no ill effects resulted from massive deposition of iron in the liver cells. Nothing analogous to the lesions of haemochromatosis in man was seen even when very large amounts of iron were administered over long periods.

Interesting and important as these investigations were, they did not seem to have much direct application to man. At that time injection of iron was regarded as dangerous (despite the large quantities which Cappell was able to use experimentally), and the amounts given were so small that it was unlikely they could influence haemoglobin production, let alone produce haemochromatosis. However, the recent use of iron in a form which can be given intravenously in large quantity[8 9] has reopened the question of whether haemochromatosis is a risk of such therapy. The amount of iron required to restore the haemoglobin to normal in a case of iron-deficiency anaemia with a haemoglobin of 50% is about 1.5 g., while the accumulation of iron in cases of haemochromatosis may amount to 25–50 g. It would seem, therefore, that the risk is not great, provided that excessive amounts of iron are not given and that the method is not used in cases of anaemia in which there is no iron deficiency and utilization of the iron to form haemoglobin is not possible.

Iron is administered parenterally in a less obvious form when blood transfusions are given. One pint of blood contains approximately 250 mg. of iron, so that repeated transfusion of patients who have no external blood loss, particularly those with aplastic anaemia, may introduce into the body large quantities of iron. It is not unknown for such patients to have received 100 or more pints of blood, representing a total of at least 25 g. of iron, which is as much as may be found in cases of naturally occurring haemochromatosis. Schwartz and Blumenthal[10] describe five such cases in which certain features of haemochromatosis appeared, and they mention eight others previously reported in the literature. In only two out of the thirteen was clinical diabetes present, but in nine there was obvious enlargement of the liver and in twelve some degree of fibrosis was found at biopsy or necropsy. It is difficult to assess the relative importance of the primary disease and the giving of blood in producing these changes, which seem to have been relatively mild. Some haemosiderosis appears to be inevitable when there is parenteral administration of iron, but whether true haemochromatosis, in the sense of pancreatic and hepatic fibrosis and eventual failure, results from this alone and is a real risk of such treatment remains uncertain. Some further investigation would be of value now that massive blood transfusion and parenteral iron administration have both become common forms of treatment.

[1] Sheldon, J. H., *Haemochromatosis*, 1935. London.
[2] Mallory, F. B., Parker, F., and Nye, R. N., *J. med. Res.*, 1921, **42**, 461.
[3] Gillman, J., and Gillman, T., *Gastroenterology*, 1947, **8**, 19.
[4] Hahn, P. F., Bale, W. F., Ross, J. F., Balfour, W. M., and Whipple, G. H., *J. exp. Med.*, 1943, **78**, 169.
[5] McCance, R. A., and Widdowson, E. M., *J. Physiol.*, 1938, **94**, 148.
[6] *Brit. J. exp. Path.*, 1933, **14**, 73.
[7] *J. Path. Bact.*, 1930, **33**, 175.
[8] Nissim, J. A., *Lancet*, 1947, **2**, 49.
[9] Slack, H. G. B., and Wilkinson, J. F., ibid., 1949, **1**, 11.
[10] *Blood*, 1948, **3**, 617.

CANCER MORBIDITY

Large-scale studies of the incidence of cancer and of the survival rate are scarce. It is over twenty years since the Ministry of Health published the findings of an inquiry into the natural duration of the disease and the results of surgical treatment. A recent analysis by Eleanor MacDonald[1] of 37,863 cases of cancer is an important contribution to the subject. The facts were obtained from the records of Connecticut hospitals, and every known case of cancer admitted to or attending any of the general hospitals in the State from 1935 to 1947 was included in the analysis. The disease was diagnosed microscopically in about three-quarters of the cases. Follow-up investigations were thorough, and information about patients who left Connecticut was obtained through reciprocal arrangements with physicians, health departments, and institutions in 41 other States. MacDonald believes that the results form a practically complete record of cancer among the 1,750,000 inhabitants of Connecticut during the period reviewed. The average incidence of cancer during the seven years 1940–6 was 194 per 100,000 men and 221 per 100,000 women. The incidence continued to rise during the period, even after correction for age. The changes in the incidence and death rates appear to indicate that earlier diagnosis leads to more effective treatment and consequently more survivals. In every 100,000 living females in Connecticut 805 had a history of cancer and 220 had survived five to twelve years from the onset of the disease; corresponding figures for men were 531 and 129. One of the analyses carried out was to group the survivors by stage of disease on admission to hospital according to a broad anatomical classification. For all sites combined, 25.4% of the males and 35.5% of the females who sought treatment while the disease was localized survived for five years; when regional metastases were present on admission the percentages were 9.1 in the case of males and 19.1 in the case of females, and when remote metastases were present they were 1.4 and 3.7. The chance of surviving five years varied considerably according to the site of the disease. The lowest rate of survivorship was among the patients in the group who developed cancer in the viscera contained in the chest cavity. Even when the disease was localized on admission only 3.9% of the men and 3.5% of the women survived five years.

The age distribution of patients with microscopically proved cancer differed between the sexes. For all sites combined, the age groups 50–59 in women and 60–69 in men provided the greatest number of admissions, and the mean age of the women at the time of treatment was 55.4 and of the men 59.6. For disease in most parts of the body the average age at which men obtained treatment was generally only a year or two more than that of the women, but in the group of patients with cancer of the genital tract and external genitalia the average age at treatment was 53.6 in the case of women and 66.2 in the case of men. This study shows that between 1938 and 1946 in Connecticut delay in obtaining treatment either through personal procrastination or inadequate medical advice has been significantly reduced and that there has been a corresponding increase in the proportion of patients surviving five years or more. MacDonald suggests that, although the facts are not very encouraging, continued efforts to reduce the delay will meet with further success.

[1] *Bull. Amer. Coll. Surg.*, 1948, **33**, 75.

RINGWORM OF THE SCALP

Small-spore ringworm infection of the hair of children under the age of puberty presents teasing problems for the clinician, the mycologist, and the biochemist. The simplest measures will cure the infection on the smooth skin, but in the hair follicle changes occur which make treatment much more difficult unless drastic steps are taken, such as by *x* rays, to produce epilation of the entire hair shaft and root. These changes include altered character of fungal growth with increased spore formation, altered *p*H of affected skin, and biochemical changes with production of a substance causing fluorescence in ultra-violet light filtered through Wood's glass. Workers in the U.S.A. have detected infection by recording *p*H variations when no infection was disclosed by fluorescence under Wood's light.

The incidence of small-spore ringworm infection in school-children was so high in the early part of the century that special schools were established and catered for more children than attended the normal schools. After 1910 the incidence fell, partly as the result of *x*-ray therapy and partly, it would seem, because of a change of phase in the natural cycle of the disease. Between the wars the incidence was very low, but there has been considerable increase in the last 10 years. Spontaneous cure does occur in a small proportion of cases. Immunity develops after the infection is cured, but some children appear to be naturally immune and will not contract the disease in spite of intimate contact with an infected child. There is no satisfactory explanation of these facts or of spontaneous cure at puberty. New parasiticidal preparations are now available for local treatment. Emulsified bases penetrate the skin more effectively, but results are not much better than those obtained with iodine in goose grease, which was employed in the last century. The same is true of the new parasiticides—the more effective producing some inflammation in the follicle, which is undesirable.

It has been generally accepted that *x* rays do no more than remove the hair, so that local treatment easily clears up what then becomes an infection of the smooth skin. Some doubt about the truth of this view is expressed by Drs. F. L. Lydon, T. Stephanides, and T. M. Robb in an article appearing at page 523. They have cured over 100 cases by epilation alone—the heads being washed with soap and water, and sterile caps being replaced every second day. It may be that this is sufficient treatment to cure any infection of the smooth skin, for perfect epilation leaves the dermatologist with no further worries. If, however, the dose of *x* rays is not quite adequate, so that epilation does not leave a shining, bald surface, or if the hair is not completely removed from infected patches, then the difficulties of treatment are, if anything, increased. This does not suggest that *x* rays hinder the growth of the fungus or render the "soil" less suitable. Indeed, in some cases after *x*-ray therapy and epilation the ringworm infection appears to become increasingly active before recovery takes place.

ENJOYING THE COUNTRY

Unlike Acts of Parliament concerned with the treatment of sickness, Acts whose purpose it is to help people to lead healthy lives seldom contain the word health in their titles. Even so, it is measures such as the National Parks and Access to the Countryside Bill, which was introduced in the House of Commons last week, that in the long run will ease the load which the National Health Service has placed on the practitioner. This Bill is designed to increase everybody's opportunities of enjoying the country. National Parks are to be created by a National Parks Commission, which will begin by considering the areas recommended in the report of the Hobhouse Committee. The Parks will be managed by committees of local planning authorities (county and county borough councils), which will have power to provide accommodation, meals, and camping sites, in addition to their duty of preserving the natural beauty of the areas. There may be some incompatibility in these two functions, but it is tempting to look forward to the time when the committees responsible for, say, the Broads and the Lake District strive to surpass each other in imaginative (and, we hope, dignified) use of the powers they possess. The National Parks Commission is also to become the guardian of "natural beauty" in any part of England and Wales and will have power to designate areas of outstanding natural beauty, which will then be made accessible to the public and will obtain protection similar to that given to the National Parks.

Another function of the Bill is to give the public access to mountain, moor, heath, down, cliff, and beach so that they may wander without trespassing; owners of land are to be compensated for depreciation. The Ministry of Town and Country Planning is empowered to buy areas of open country and hand them over to the National Trust or some other suitable body. County councils, with the help of district and parish councils, are to survey all footpaths and bridle-paths, and it is hoped that at the end of three years a Domesday Book of all rights of way in the countryside will have been compiled. Where necessary new rights-of-way are to be created. The National Parks Commission is to make proposals for long-distance footpaths—such as the Pennine Way, the Pilgrims' Way, and a path right round the coast. Finally, the Bill gives powers to the new Nature Conservancy to set up nature reserves, which are defined as land managed for the purpose of providing opportunities for studying and for preserving flora and fauna or geological or physiographical features.

FELLOWS OF THE ROYAL SOCIETY

The following were among those elected to the Fellowship of the Royal Society on March 17: Ernst Boris Chain, M.A., D.Phil., University Demonstrator in Chemical Pathology, University of Oxford; distinguished for his work on enzymes of snake-venom and bacteria, and especially for his researches on penicillin and other antibiotics. Kenneth Mather, Professor of Genetics, University of Birmingham; distinguished for his contributions to genetics and particularly for his studies of polygenic inheritance. Walter Thomas James Morgan, D.Sc., Ph.D., research worker, Lister Institute of Preventive Medicine, and Reader in Biochemistry in the University of London; distinguished for his contributions to the chemistry of immunology and blood groups. David Aylmer Scott, research member, Connaught Laboratories, University of Toronto; distinguished for his contributions to the chemistry of insulin, heparin, and carbonic anhydrase. Wilson Smith, M.D., Professor of Bacteriology, University College Hospital Medical School; distinguished for his researches on the virus of influenza and on the pathology of staphylococcal infections. Frank George Young, D.Sc., Ph.D., Professor of Biochemistry, University College, London; distinguished for his studies of the part played by the hormones of the anterior lobe of the pituitary gland in carbohydrate metabolism.

Dr. A. P. Thomson, F.R.C.P., will deliver the Lumleian Lectures before the Royal College of Physicians of London (Pall Mall East, S.W.) on Tuesday and Thursday, April 5 and 7, at 5 p.m. His subject is "Problems of Ageing and Chronic Sickness."

TRILENE AS AN ANALGESIC IN LABOUR

REPORT OF THE ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

BY

F. NEON REYNOLDS, F.R.C.S.Ed., F.R.C.O.G.

An account of the investigation into the possible use of trilene by midwives as an analgesic in labour has been issued by the Royal College of Obstetricians and Gynaecologists. The report does not seem to have received the publicity in the medical press which it demands. A standard method of administration by means of the modified Freedman's inhaler was adopted and efficacy, effect on labour, and safety for mother and child were investigated.

Results of Investigation

The results, in brief, arrived at under these headings were as follows:

Efficacy.—Adequate relief can be given to a high proportion of cases—76% to 89%—without any special skill upon the part of the administrator. The degree of analgesia provided was superior to that obtained from gas and air by Minnitt's method.

Effect on Labour.—No evidence was adduced of any adverse effect upon length of labour, forceps rate, or obstetrical interference rate. No case of diminution of uterine contractions due to trilene was recorded, but in three cases out of 1,168 unexplained delay might have been attributable to the analgesic. A small proportion—4.6%—of patients became uncooperative mainly because they became too sleepy to push in the second stage. This incidence did not appear to have any relation to the duration of the trilene analgesia.

Safety to Mothers.—In the group to which trilene alone was given there was one maternal death—a rate of 0.86 per 1,000—and that on the fourth day of the puerperium in a patient with mitral stenosis. In marked contrast the death rate was more than doubled—1.96 per 1,000—in the group to whom no analgesic or anaesthetic of any sort was given.

The conclusion, as published in the report, that "there is no evidence in this series that the standard method has any influence on the maternal mortality rate" might even be described as an understatement. The paragraphs which follow this conclusion deal with the possible effects upon maternal respiration and pulse rate. No ill effects upon respiration were noticed. Possible alterations in pulse rate are referred to, but comment here is not possible since the details published are insufficient. The information given us is unconvincing because the amounts of trilene administered vary to an inexplicable and almost unbelievable degree. It is difficult to reconcile 9 ml. of trilene in twenty-eight minutes, 7 ml. in three and a quarter hours, and 7½ ml. in a little more than ten minutes.

Effects on the Foetus

Foetal Pulse Rate.—The criterion of foetal distress was taken as slowing of the foetal heart rate to a hundred or below. This occurred in 3 cases among 1,168 to whom nothing else but trilene was given. The opinions reached were not unanimous. There were 18 cases in which the point arose, but in all but the three mentioned above other factors were present, such as difficult labour or the use of other non-volatile analgesics in addition to trilene; furthermore, 11 out of this 18 occurred in the same hospital, and the observer of these cases considers that the possibility of some effect on the foetal heart rate must be borne in mind.

Asphyxia Neonatorum.—Some degree of asphyxia occurred in 3.9% of babies where trilene alone was used, but a considerably higher proportion was noticed if pethidine had been administered previously.

Stillbirth Rate.—There were 25 stillbirths, again among 1,168 patients, but in no case was the analgesia considered in any way responsible. This gives a stillbirth rate of 21.4 per 1,000. In a series of 2,040 patients to whom no analgesia or anaesthetic of any sort was given the stillbirth rate was 71.56 per 1,000. The final conclusion was that there was no evidence to show that trilene influenced the stillbirth rate in any way.

Neonatal Death Rate.—In the three groups of cases investigated the lowest neonatal death rate—5.13 per 1,000—was obtained in the series of patients to whom trilene alone was given. Where no analgesic at all was used the rate was 35.94 per 1,000, but this high incidence is explained by the inclusion of a large number of premature labours. In the group to which other analgesics as well as trilene were given, a figure of 11.80 per 1,000 was found. The conclusions were again that trilene had no influence on the neonatal death rate.

Final Conclusions

In the final summing up the observers expressed their opinions on whether the use of trilene by unsupervised midwives trained in this method would be safe. The majority—eight in number—were of the opinion that it could be safely employed with great benefit to the mother, and stated that they would be quite happy to be responsible for a district in which the use of trilene by midwives was allowed. Two were of the opinion that further investigations were necessary and that in the hands of midwives without supervision it might be used for longer periods than was commonly the case during this investigation; and two considered it unsuitable for domiciliary midwives on account of its effect on the foetus and the production of a non-cooperative state in the mother.

In spite of this large majority and of the evidence produced, the final recommendation of the observers was that this method should not be made available to unsupervised domiciliary midwives. The reasons actually given in the report are:

(1) The limits of variation of the trilene vapour/air mixture delivered by the apparatus are far too great.

(2) Under less ideal conditions or by deliberate misuse these limits can be caused to vary still further.

(3) As a result of the above and also due to varying tolerance in different individuals cases will occur where the mother will pass beyond the stage of co-operative analgesia into a state of uncooperative stupor. This has occurred in the best of hands, and in the case of less skilled supervisors this condition might easily be taken to a state of anaesthesia.

In writing this précis every effort has been made, and I think successfully, to avoid divorcing subject-matter from context, thus conveying any false impression or biased view. Certain points deserve emphasis; the most striking, perhaps, is that the lowest mortality rates in both mothers and babies are found in that group of patients to whom trilene alone was administered. So far as maternal mortality is concerned this is a finding to which attention has been drawn before, and it is of the utmost importance that this aspect of the use of analgesics should be recognized. The low stillbirth rate is extremely interesting but cannot, of course, be attributed entirely to the use of analgesics.

The adverse part of the report relates to non-cooperation of the patient due to excessive stupor and the danger of this passing into a state of anaesthesia, together with the varying strength of the trilene vapour delivered by the apparatus. It was felt that these disadvantages might be still further increased by unsuitable home conditions or by deliberate misuse. The three cases of non-cooperation and three of alteration in foetal pulse rate constitute no greater proportion of such complications than is found in patients to whom no analgesic is given.

No one is anxious to press for an analgesic which would increase the risks to mother or infant, but the outstanding features of this report are that with the use of trilene mortality rates show an absolute decline. A certain amount of risk has to be taken in childbirth anyway, and it would appear reasonable to suppose that the risks of using trilene, such as they are, would at least be offset by the consequent reduced mortalities. A risk is taken every time an anaesthetic is administered; fatalities have been reported even under gas for removal of teeth, but no one would demand minor operations being carried out without its use. Is it reasonable to take for granted that midwives would deliberately misuse the apparatus by placing the bottle in hot water or would adopt other illicit means to increase the dosage? My experience of them does not support such an idea for a moment. If the practice is known to exist, surely it can be remedied in some way other than at the cost of human suffering?

One is forced to the conclusion that the investigation upon which the report from the Royal College of Obstetricians and Gynaecologists is based produces all the evidence in favour of a trial of this method being made. I must repeat that eight out of twelve observers were of the opinion that it could be safely so used; the majority of them (number not given) stated that they would be quite happy to be responsible for a district in which trilene was available to domiciliary midwives. We have no alternative analgesic the practical application of which is so

widely possible. I would ask, therefore, that districts be chosen in which a clinical trial can be carried out upon a much wider scale than the scope of the recent investigations allowed. I believe the results would more than justify the undertaking.

We must ask ourselves whether the doubts of the few or the slight risks they envisage should prevail and thus deprive thousands of women of the relief so greatly needed. Let those who have expressed their readiness to shoulder the responsibility be allowed to take action without further delay to rectify a state of affairs which is causing national anxiety.

STRATEGY OF HEALTH EDUCATION

TELLING THE PUBLIC

The subject of a symposium arranged by the Public Health Department of the Middlesex County Council on March 14 was "The Principles and Technique of Informing the Public." The all-day meeting was attended by the public health and other staff of the council, and medical officers and health visitors from neighbouring authorities. The words of Lord Derby, who was Prime Minister in 1866, stood at the head of the programme: "Health instruction is even more essential than health legislation, for the best laws are waste paper if they are not appreciated and understood."

Dr. W. HARTSTON, deputy county medical officer of health, who presided, said that the purpose of the symposium was to give the Middlesex authorities some guidance on health propaganda. The people most in need of health education were not people of the highest intelligence nor with any wide range of ideas; they belonged to that 30% who were in grades 4 and 5 of the five intelligence groups in the Army intake during the later years of the war. Therefore the educational appeal must not be pitched too high.

Health education, Dr. Hartston continued, was bound to be a somewhat disappointing business. "Many are taught, but few learn." But if it could be imparted satisfactorily and acceptably it would rid us of most of our avoidable inflictions. He pointed to the success obtained with diphtheria immunization. That could be said to be the result of teaching and propaganda. He mentioned Harrow in his own county, with a population of over 200,000, which in the years 1946–8 had no deaths at all from diphtheria, and in 1948 no cases; yet he supposed Harrow had its share of the above-mentioned 30%. Dr. Hartston suggested that time might be bought on Radio Luxembourg to "call all lumbagos"—or any other class. This suggestion was opposed by Dr. CHARLES HILL, the next speaker, on the ground that people would say, "What is Middlesex County Council up to? Can't we keep our own backaches?"

Personal Contact

The Radio Doctor began by saying that in all forms of health education the fact must be reckoned with that the vast majority of people in this country, while they had a lively interest in ill-health, had relatively little interest in the maintenance of good health. The purpose of health education was to modify that attitude. Too little was known about the prevention of disease. The public was apt to assume that there was a mass of knowledge which, but for the reluctance of those who possessed it, would be available for general assimilation. The sad and depressing truth was that there was really very little knowledge. It was perhaps no longer true that practitioners were "brought up on the rare to go out and treat the trivial," but pathology dominated the curriculum, and physiology had a long way to go before its rightful position was achieved.

Dr. Hill doubted whether health education for the over-forties was worth while. Habits of life and conduct, of eating and drinking, were then firmly laid down, so that it was beyond the power of the most enthusiastic health educator to jerk them out of their routine path. As for the means of health education, he thought that exhibitions, like lectures, were largely a waste of time, attended for the most part by the converted. As for posters and leaflets, there had been an immense improvement in recent years. Especially commendable were posters which had a touch of humour, like those of Fougasse for the Central Council for Health Education. But the most effective medium was the spoken word—spoken by the doctor or health visitor. He hoped that eventually the burden of work on the doctor would be eased so as to give him more opportunity for these personal contacts.

For broadcasting on health subjects, or indeed on anything else, Dr. Hill laid down some simple rules: (1) Take advantage of the fact that people are interested in ill-health, and use ill-health as an opening for passing on to more positive instruction. (2) Don't despise small and unambitious jests. Don't be afraid of saying something which might not be wholly approved by an audience of medical practitioners. (3) Never mind Sir Ernest Gowers: talk English as you ordinarily talk it.

The Written Word

Mr. MACDONALD HASTINGS, editor of the *Strand Magazine*, discussed the value of the written word, remarking that what sounded well very seldom read well, and vice versa. He looked with more toleration than some on the popular press. He saw in its sensational headlines and comic strips not the signs of declining popular intelligence but the emergence into relative literacy of a population which previously had read next to nothing at all. He even excused the inaccuracy with which medical matters were often handled in the lay press. Four-fifths of it was the profession's own fault. Not once in a thousand times did a newspaper set out to print something that was false. The errors arose from the speed with which newspapers were published, the enthusiasm of individual reporters, and the absence of satisfactory liaison between the medical profession and the Press so that there were no rapid means of obtaining an authoritative opinion.

In the general discussion, in which several health visitors took part, it was suggested that the county council should have a whole-time health education officer, not necessarily a medical man. Suggestions were made for sample surveys, also for area group studies, the group being formed of medical officers, nurses, health visitors, and school teachers. The final word was with a dental officer, who pleaded that, while there might well be education directed to the prevention of caries, there should be no propaganda for more dentistry—at present.

MENTAL HOSPITAL RECORDS

A conference of the Psychological Medicine Group of the Association was held at B.M.A. House on March 7, with Dr. W. G. Masefield in the chair, principally to discuss the question of statistical returns from mental hospitals. Dr. C. P. Blacker, who has played a considerable part in devising the new system of records, said that he must not be regarded as responsible for all the final features of the system. He would have liked to see some of the questions differently framed, and he regretted the use of a hospital index card as a substitute for a case-sheet front page.

Turning to the hospital index cards now in use, he discussed the genetic and demographic questions numbered 20 to 29. The first question, concerning twins, scarcely required comment; the value of twins for genetic research was universally recognized. Another question asked whether the parents were related by blood. It ought to have been specified in the handbook of instructions that first-cousin marriages were here intended. The question was capable of bringing to light new forms of mental defect, or perhaps of disorder, in which recessive genes played a part. Question 22 asked whether the patient was related by blood to his first spouse; the question was limited because to have brought in second or later spouses would have introduced too many complications. But the question had an important bearing on the amount of consanguinity, which varied in different localities. With regard to the next question, which asked whether the spouse had been dealt with under the Acts, a wider net might have been cast by asking whether the spouse had ever been treated by a psychiatrist; but questions of interpretation of "psychiatrist" would have arisen, and there was much to be said for confining questions to simple factual alternatives.

Another question was on the age of the mother at the birth of the patient; the significance of this in relation to mongolism was well known. The answers to the questions relating to siblings would bear on the fertility of the parents of the mental hospital population, and the question on the number of the patient's children born alive would give information, though incomplete, about the fertility of that population.

This year the analysis of mental health records would now be made with Hollerith machinery instead of by the laborious pen-and-ink methods hitherto followed. Nevertheless, the labours that the new arrangements would impose on Somerset House would be immense. In time, he hoped, the bulk of the pressure would be removed if properly equipped statistical departments, perhaps linked with the departments of social medicine in the universities, were established in every region. Such regional departments could provide a statistical service to every hospital. Professor Ryle had suggested that these regional departments should be assigned dual functions—namely, a statutory function to provide the central office with whatever statistical material it might require, and an independent local function of helping the regional hospitals and other bodies and the university in their research projects.

The present format of index cards should not be regarded as immutable; indeed, he had the authority of Mr. Barter, chairman of the Board of Control, for saying that they would not be. Dr. Blacker suggested a plan whereby the Board could pursue a systematic and yet elastic programme of research by issuing to hospitals and institutions new front pages of case-sheets at intervals. It would be most advantageous if interested departments—such as social medicine and genetics—could be notified of cases interesting to them, and he was convinced that the dangers of such a system were much exaggerated. The public was accustomed to the notification of dangerous or contagious diseases; it would be but a step to accustoming it to the notification of interesting diseases or circumstances from which useful information could be gained.

Social Influences

Professor T. Ferguson Rodger addressed the conference on the value of diagnosis in clinical records in mental hospitals. At the present time, when vast decisions were frequently taken which affected the mode of life of everyone in the nation, the psychiatrist, alive to his social responsibility, was being forced into an active role. How far was the psychiatrist equipped to give advice on planning? Possibly in this country, thanks to the work of E. O. Lewis, more was known than in any other about the incidence of mental defect, but how much was known of the social conditions which gave rise to neuroses? He would like to know—he could not discover—how much loss of production, psychopathy, delinquency, how many prison cells and mental hospital beds, should be placed to the account of the bad housing conditions of the Gorbals of his own Glasgow. The present position of psychiatrists was like that of a physician concerned with individual symptomatology but not realizing the importance of sanitation.

When one thought along these lines the new index card seemed a very modest affair. In an era of planning it was probably more important to know about these things—social influences—than about genetics. For the first time entire new towns were being planned before they were built. Physical hygiene had had its say in planning them, and they ought to be in a position to provide accurate information about the requirements of mental hygiene. A town could now be planned for a low infant mortality rate; it should be possible to plan a town for a low delinquency rate. The index card was on the right lines for setting going a scheme of social research. Mental hospitals would always be the chief training centres for the psychiatrist, and careful case-taking was a necessary part of his training. They could not hope to cover all relevant factors completely, and if very detailed records were insisted on case-taking might become an end in itself; but a good clinical record should reveal the dynamics of the case and suggest the problems which were to be tackled either by psychotherapy or by social adjustment.

Professor Rodger referred to the handicap of the large variety of diagnostic classifications which had been used in the past. A great deal could still be done in following up the after-career of patients who, while they might recover from the attack and leave hospital, presented a very different picture when next admitted. The correlation of diagnosis and prognosis might help to narrow down the very large margin of error which occurred when labels which had prognostic significance were attached. The fact that the response of the manic-depressive patient to electroplexy was so different from that of the schizophrenic was only one of the unmistakable indications that diagnosis was a highly significant procedure. "New diagnostic procedures are being introduced," said Professor Rodger in conclusion, "and research on clinical assessment will no doubt continue with the aim of achieving a better classification. In the meantime, in the evaluation of treatment, in genetic studies, in research on pathology and psychopathology, our present classification is capable, if we use it properly, of serving us well for many years to come."

Dr. Doris Odlum complained of the vagueness and woolliness of the classifications at the present time. Nearly all diagnosis was descriptive, so that they were very likely, if a case took a certain course, to assume that the diagnosis had been wrong—in other words, to judge diagnosis by the end-result. Dr. Rees Thomas said that what they had tried to do in the index card was to be factual. A great many things had been left out, but one factor of great importance was left in—namely, the physical condition. The system allowed for a change of diagnosis. It had seemed a little unfair on any doctor to allow him to take an early case, make his diagnosis within a maximum of three months, and hold him down to that diagnosis for all time.

Dr. Masefield, in closing the discussion, said that the Board of Control was to be congratulated on having produced these index cards. There was nothing to stop anyone adding information to them.

MALARIA AS A WORLD PROBLEM

UNIVERSITY OF LONDON LECTURE

Professor B. G. MAEGRAITH, of the Liverpool School of Tropical Medicine, delivered a University of London lecture on Feb. 24 at Westminster Hospital Medical School, his subject being "Malaria as a World Problem."

Not enough attention, said Professor Maegraith, was given to malaria in the average medical curriculum. Yet malaria was the most widespread of human diseases, not even excepting the common cold. Its mortality was comparable with that of the influenza pandemic of 1918–19, and, while malaria was a disease which killed, it was even more a disease which produced a high morbidity. It was primarily a disease of rural areas, and it must be regarded as a great cause of world food shortages, slowing down agricultural production over vast areas. In war it interfered with strategy. In the 1914–18 war it nearly paralysed operations on both sides in the Balkans, and in the last war it was not until some control over malaria was established that the fighting in the south-west Pacific could proceed.

The lecturer went on to discuss the natural history of malaria and the methods by which it was spread. Malaria, he said, could be recognized from the earliest human records; it was common in Greece and Rome. The ancient doctors were able to separate fevers into two classes, continuous and intermittent, and the intermittent fevers must have been malaria. The organism was not seen and described until the early nineteenth century. Laveran was the first to prove in 1880 that it was present in the blood and was in fact a protoplasmic parasite. Manson argued in an article in the *British Medical Journal* in 1894 that the malaria parasite could be picked up from human blood by mosquitoes. He propounded the theory that the mosquito carried malaria. Pfeiffer, some years earlier, had also suggested that the mosquito might carry the parasite, and had mentioned this to Koch. Ross, studying avian malaria, traced the parasite from the blood of the bird to the mosquito, and from the mosquito to another bird. The final proof of the transmission of human malaria was given by Manson at the London School of Tropical Medicine when he demonstrated the complete cycle.

Methods of Control

It was on this basis that attempts to control malaria rested. If only the parasite could be destroyed in the human blood the

infection could be got rid of altogether. To this field had been brought the armamentarium of chemotherapy. Theoretically it might be possible to provide some chemical barrier beyond which the parasite could not pass, but there was at the moment no chemical substance which would destroy the parasite when it was injected. The parasite, however, underwent a phase of its development in the tissues before it entered the blood stream, and there were certain chemical substances which were of use here, the outstanding ones being mepacrine and paludrine. How effective these drugs could be was shown in the last war when, up to 1942, the incidence of malaria in the south-west Pacific was such that warfare was almost impossible; then mepacrine was introduced and used almost under duress, and the incidence of malaria fell markedly. But when it came to dealing with the control of malaria in large communities it must be admitted that chemotherapeutic means were of no real value over a long period.

The mosquito could be prevented from biting man by screening. Screening was valuable under certain special conditions, but it was a costly business and over a wide range of humanity almost impossible. Repellants had been used—substances which made the body unpleasant to the mosquito—but there was no substance which would last long enough to give real protection. One was driven to deal with the mosquito itself. It could be killed by the introduction of natural enemies, such as fish, by the drainage or control of swamps, or by the deliberate distribution of insecticide. Professor Maegraith discussed the different methods and their application in various parts of the world, and described the use of insecticides, principally D.D.T. and gammexane. D.D.T., he said, had been developed to a point where its residual activity was such that spraying need be done only once every two or three months. It had no very outstanding "knock-out" effect, but its residual effect was very important. The mosquito took a week or more to become infective after taking blood from a human subject. When exposed to these substances it could not live long enough to become infective, and so the chain might be broken. This method of residual spraying had made all the difference in rural communities. It had made the control of malaria in big territories a feasible proposition.

FAMILY PLANNING CLINICS

OPPORTUNITIES AND LIMITATIONS

A medical conference was organized in London on March 12 by the Family Planning Association. It was attended by between sixty and seventy medical officers of F.P.A. clinics, of which there are now 78, run by 64 branches. Dr. HELENA WRIGHT and Dr. ANNIS GILLIE presided over the two sessions, the main subjects being the help to be afforded by the clinics in cases of marital difficulty and in the treatment of minor gynaecological conditions and subfertility.

Adjustment of Marital Relations

The subject of marital difficulty was opened by Dr. STELLA CHURCHILL. She remarked on the number of cases in which mutual satisfaction in marriage was not achieved; such failure, of course, was not to be laid wholly at the door of the wife: perhaps it derived much more often from the husband. But she addressed herself to one particular psychological cause in women—namely, narcissism, the self-regarding state. The narcissistic woman, she said, was in love with the idea of being in love, and too many got no further in marriage than that. The pity was that many of these narcissistic women were superficially attractive, but they had very little idea of the element of giving in the marriage relationship.

Dr. NOEL HARRIS referred to the distinction between cases which could be helped at the clinics and those which should be referred for specialist treatment. It was always a matter for consideration by the clinic officer whether underlying what appeared to be a superficial and temporary condition was a neurosis. A large number of what were termed anxiety states might not be linked up in any way with a neurosis but might simply be attached to a particular problem. Each person had a constitutional pattern, and the normal personality was a blend of many types which in their abnormal manifestations were schizoid (reserved and solitary), obsessional (methodical, precise, exact), and so forth. When a marked personality type was encountered it was necessary to be on one's guard; slight obsessional tendencies might indicate a neuropathy which required more expert handling and more time than a clinic could afford.

Dr. Harris went on to discuss conditions of impotence in the male. These included failure of erection, premature ejaculation, and lack of sexual desire. Premature ejaculation was very frequently associated with an anxiety state, and if the anxiety was relieved and adequate instruction given the condition would pass away very rapidly. Failure of erection was much more difficult to deal with. It might be a local condition or linked up with some constitutional disturbance, though definite proof of the latter might be lacking. Very little could be done about it. The value of injections of progesterone, he thought, had not been established. Failure of erection might be closely connected with lack of sexual desire, which was much more likely to need intensive and prolonged treatment. Very probably the underlying condition was depressive. Frigidity was often associated with sexual weakness as well as with lack of knowledge of sexual technique. Finally, he touched on perversion, often misunderstood and badly dealt with, and homosexuality, which he did not think in its extreme form could be cured by any psychological treatment. It was sometimes forgotten that extreme homosexuality was at one end of a scale and normal heterosexuality at the other, and in between there were any number of intermediate grades, in some of which help could be given.

Minor Gynaecological Conditions

Dr. JOSEPHINE BARNES began by saying that gynaecology could scarcely be divided into minor and major, and that minor gynaecology could hardly be said to exist. Nevertheless, there were a number of conditions in which the clinic could afford help to the patient. One very common condition among married women was the early case of prolapse. Personally she thought that ring treatment should be resorted to very seldom; quite a number of ring ulcers and occasionally carcinoma were seen. Most cases of prolapse were better operated on. In early prolapse a measure of extreme value was physiotherapy. In cases of retroversion it was necessary to be careful what one said to the patient. So often patients came up saying that they had been told that their womb was "twisted." She preferred to tell them that the womb was tending to fall back. Very few operations for retroversion were done, but in some cases operation was worth while.

In cases of leucorrhoea the treatment should be directed to the inflammations which gave rise to it. For cervicitis by far the most satisfactory method was cauterization with the electrocautery. Various degrees of vaginitis caused leucorrhoea. The vagina had on the whole a successful defence mechanism, but once this was upset there might follow infection by various organisms. Dysmenorrhoea accounted for about half the outpatients seen nowadays; in the spasmodic type it was worth giving stilboestrol a good trial; the congestive type was much more difficult to treat. Finally Dr. Barnes touched on the early diagnosis of cancer and again stressed the diagnostic value of the clinic consultation.

Treatment of Subfertility

Mr. LINTON SNAITH considered that the task of the clinic doctor should be restricted to making the initial examination and giving reassurance and general advice. F.P.A. clinics should not be turned into minor hospital departments. There were two chief types of cases for which such clinics were ideal: cases in which there were difficulties in marriage arising from sexual maladjustment, and genuine cases of subfertility after two years or more of marriage. The clinic could in the latter cases initiate investigations and sometimes, in full co-operation with the hospital staff, deal competently with the cause. After marriage many cases came forward while as yet there was no real evidence of subfertility, and he suggested that clinics, while admitting the value of investigation, should not rush into it too

soon. The competent clinician could make a pretty good estimate of subfertility, and in many cases reassurance was all that was wanted. As for the genuinely subfertile group, those who had been married for two or three years without conception, many of these cases must be dealt with at the hospital and not at the clinic, though if investigation showed the problem to be one of marital maladjustment the help given by the clinic might be sufficient to put it right. It was surprising in how many cases the sex relationship was unsatisfactory after years of marriage.

The chief cause of subfertility was constitutional—meaning both the physical and the psychological constitution—and in the majority of cases this could not be modified, though much could be done to keep the morale of the couple high. Some of the functional causes of subfertility were obscure. He was a little critical of the various methods adopted for the treatment of tubal spasm, and was not convinced that antispasmodics had any effect. Of the organic causes tuberculosis was one of the most important.

MEDICAL FILMS

Excision of Intervertebral Disks

Mr. J. E. A. O'Connell is to be congratulated on his film "Excision of Intervertebral Disks," made in the Department of Neurosurgery at St. Bartholomew's Hospital.

The first part of the film shows the physical signs of a "typical" disk protrusion. This is followed by shots of the operation illustrating the main points of Mr. O'Connell's technique. The earlier part of the operation shows up very well indeed, but the pictures of the exposure of the nerve root and the removal of the disk are on the small side. This part of the operation must be one of the most difficult to photograph satisfactorily owing to the very small area that has to be shown at the bottom of a very deep wound. In Mr. O'Connell's film it would be difficult for a person not well acquainted with the detailed anatomy of this part to appreciate that the disk in the picture was actually protruding. Moreover, the non-expert might have some difficulty in recognizing the nerve root. To convince a disbeliever so far as this lesion is concerned one must be able to show the disk "sticking out" and not merely as a shiny flat surface.

The final part of the film deals with the after-treatment and shows the type of exercises the patients perform. The film is in colour throughout and is of a uniformly high standard. It should be of great value and interest to those already acquainted with the operation. It would have a much wider appeal, however, if some close-up shots of the region of the nerve root and intervertebral disks could be incorporated.

NURSES AND THE N.H.S.

NATIONAL CONFERENCE

The sixth of a series of national conferences on nursing problems, arranged by the Royal College of Nursing, was held in London from March 3 to 5, when the general subject was "The Machine and the Nurse," meaning by "the machine" the new hospital arrangements under the National Health Service. The conference was attended mainly by matrons and principal nursing officers. The practice was followed of having discussions in groups and of bringing forward the group conclusions at plenary sessions.

Dr. John Kershaw, divisional medical officer for North-East Essex, pointed out that the "machine" was a new one. Many of the difficulties were administrative, and, like the problems of civil defence in war, would settle themselves in time. The administrators were themselves experimenting and changing their ideas. New people were being brought into hospital management. Some regional boards had brought on to hospital management committees people who had never had anything to do with hospitals before, but whom they thought could be trained to be sound hospital administrators.

There were many expressions of assent when Dr. Kershaw said that he gathered that nurses did not feel they were getting a fair voice in hospital management at the present time. In the old days the matron had considerable power, for committees were composed of lay people among whom her special knowledge of administration counted for much. The nursing side should have fair representation, and matrons should be given access to committees where their special administrative knowledge would be of value. Dr. Kershaw said that what was wanted was a smooth-running administrative machine at national, regional, and hospital levels, and to get this it was necessary to compromise. The administrators should be prepared to make a little concession to administrative untidiness where human needs conflicted with "streamlining."

The principal theme at the concluding session was the place of the matron or nursing representative on hospital management committees. Some of the matrons present claimed that, even if technically not members of such committees, they should have a right to be present when matters affecting nursing were discussed. Others said that it was of even greater importance to have the right to attend subcommittees; the main committee often did no more than "rubber stamp" subcommittee decisions. The question of presenting nursing opinion to the regional boards was also mentioned. It was stated that one regional board had invited more than fifty matrons in its area to a meeting at which they had given the board and its chairman their views on nursing matters.

Regional meetings of principal nursing officers were strongly advocated. Another point on which there was general agreement concerned the need for cultivating social life in hospitals. The day of the ridiculous shut-in sitting-room where nurses were allowed to receive visitors only at certain times had ended or must end. It was suggested that the lack of social life in hospital nursing was one of the main factors militating against recruitment.

Preparations and Appliances

A PORTABLE RESUSCITATOR

Dr. B. G. B. LUCAS, research assistant in anaesthesia, University College Hospital, writes: Now that the respiratory depressants, such as the barbiturates and curare, are in common use in anaesthesia and in electric convulsion therapy, some form of resuscitation apparatus becomes almost a necessity. Kreiselman (*Anesthesiology*, 1943, 4, 608) described a simple resuscitator consisting of a bellows bag and face-mask. This has been modified so as to use oxygen, and has been constructed from standard parts so far as is possible.

The apparatus consists of a Connell bellows bag mounted on a McKesson pattern face-mask. On the base plate of the bag is a Heidbrink expiratory valve which can be loaded, and an inlet pipe through which oxygen is fed from a 30-gallon (136-litre) cylinder via a combined demand regulator and reducing valve. The regulator is set at atmospheric pressure so that oxygen flows automatically when the bag is expanded or if the patient breathes of his own accord. The whole apparatus is carried in a fibre case 19 by 13 by 8 in. (47.5 by 32.5 by 20 cm.) and weighs 25 lb. (11.34 kg.) complete. No spare cylinder is carried, but an oxygen-contents gauge is mounted on the side of the reducing valve (see accompanying photograph). This apparatus was made for me by Medical and Industrial Equipment, Ltd., 12, New Cavendish Street, W.1.

Reports of Societies

TRAUMATIC CHANGES IN THE BRAIN AFTER DELIVERY

At a meeting of the Section of Neurology of the Royal Society of Medicine on March 3, with Dr. WILLIAM JOHNSON, the president, in the chair, a lecture was given by Professor B. BROUWER, of Amsterdam, on "Traumatic Changes in the Brain after Spontaneous Delivery at Full-term." The president introduced Professor Brouwer as a neurologist whose fame was world-wide and whose Neurological Institute many of them had visited with great profit.

Professor BROUWER said that he proposed to present certain material from the Neurological Institute at Amsterdam in the preparation of which he had worked in collaboration with Dr. Cornelia de Lange, professor of paediatrics at the university. They were all aware of the clinical syndromes which might arise after birth—for example, muscular palsy, spinal paralysis, mental disorders, and idiocy. Haemorrhages into the pia and arachnoid and in the central nervous system might occur after almost every birth and disappear spontaneously. The number of cases in which blood was found on lumbar puncture was high, and not infrequently haemorrhages were seen in the retina. Destructive processes in the central nervous system might be observed not only in the premature infant but also in the infant born at full-term and without instrumental aid. The examination of such cases of birth injury had shown that not only were haemorrhages frequent in various parts of the central nervous system but that other processes might also be present. Destruction was seen, for example, in the striate bodies, and it was rare for the effects of birth injury to be confined to the pia.

Over the last two years his Institute had received the brains of six children, all delivered spontaneously at full-term, in which there were found signs of intracranial birth injuries. In four cases the brains had been studied microscopically; in the other two the examination was still proceeding.

Illustrative Cases

The remainder of Professor Brouwer's lecture consisted of a detailed account of each of these cases, illustrated by lantern slides of brain sections. The first of the four cases was a girl, a vertex presentation, whose birth weight was 3,520 g. For some days after birth she had convulsions, for which she was treated in hospital. In a short time the condition improved and the child was sent home. At five months she was re-admitted suffering from frequent epileptic fits. Ophthalmological examination revealed no retinal lesion, and there were no signs of meningitis. There was marked microcephaly. Examination post mortem showed a central haematoma in the parietal region. Sections of the medulla might be regarded as normal, and the pyramidal tracts were well formed. Microgyria was very evident. The architecture of the occipital lobe was altered, and among other brain changes he called particular attention to a peculiar "cactus" formation in the neuroglia. Conglomerations of fat cells were seen in many parts of the brain. Degeneration was seen only in the pallium; the deeper structures of the brain were largely unaffected. His conclusion was that the changes were not caused by congenital malformation but were the result of brain trauma at birth. The question arose whether the microcephaly might also be regarded as the result of birth trauma. Systematic examination of the brain pointed strongly to a traumatic origin for the microcephaly. It seemed likely that this was caused by compression at birth.

In the second case death occurred on the thirteenth day. The cranium seemed small, and only a small quantity of fluid could be removed by lumbar puncture. A clinical diagnosis of meningitis had been made. On post-mortem examination blood-clot was found on the posterior half of the right ventricle, and small conglomerations of glial cells were seen in the surrounding tissues.

The third child was taken to hospital with fever and diarrhoea, and the consulting neurologist suggested the possibility of a lesion of the brain stem. After some improvement the child was discharged, but was readmitted and died at 13 months. On examination great destruction was found in the corpus cerebri, with the formation of cavities. Here again Professor Brouwer concluded that subdural haemorrhage following birth injury had led to under-development of the brain with great destruction of the cortex, but the deeper parts of the central nervous system had been left intact.

The fourth case was the second child of healthy parents, and had developed epileptic fits at the age of 7½ months, but no objective neurological symptoms were found. The child died at the age of 2 years and 4 months, and again on examination of the brain it was found that a great deal of the cortex was destroyed. It was true that in this case the epileptic fits had not occurred until several months after birth, but it was well known that such fits might take place after a "silent" period.

PHARMACOLOGICAL EXPLORATIONS OF PERSONALITY

Professor JEAN DELAY, who holds the chair of psychiatry in the Faculty of Medicine of Paris, gave an address in the Section of Psychiatry, Royal Society of Medicine, on March 8. The chair was taken by Dr. J. R. REES. Professor Delay, who was elected an honorary member of the Section, was visiting this country in connexion with the International Congress of Psychiatry to be held in Paris in 1950, of which he is chairman.

Professor Delay spoke first of the history of the use of drugs to recall forgotten memories and to explore latent personality. The modern use of drugs in the study of psychopathology dated from 1845, when Moreau de Tours concluded that dreams experienced under the influence of hashish were identical with the hallucinations of psychotic patients. Other drugs came into vogue later, and now interest was centred on the sodium barbiturates and methedrine. In speaking of hashish, Professor Delay related the following case history.

A lad of 18 had quarrelled with his mother and stepfather and left home. One night he visited a black-market restaurant and purchased some cigarettes. While smoking the cigarettes he had an acute hallucination. He made straightway for his former home, where he found his stepfather in bed, strangled him, and returned to his lodgings. Waking late the next morning, he was overwhelmed by his recollections of what he had done, and gave himself up to the police. The police, on visiting the house, found the stepfather having his lunch. The son had not visited the house at all, and nothing had happened. The cigarettes had contained hashish.

The sodium barbiturates had been increasingly used for narco-analysis, particularly during the war, not only in the treatment of acute combat neuroses but also for the diagnosis of malingering. Many techniques were employed, but the common basic approach was the exploration of the unconscious. A distinction must be made between the techniques in which the doctor was passive, allowing the drug to elicit the unconscious material alone, and those in which he played an active role, questioning, suggesting, and interpreting to the patient.

Methedrine, whose psychotonic action was first discovered in 1938, produced on intravenous injection (30 mg.) a state best described as "methedrine shock," with raised blood pressure as well as psychological effects. It was twice as powerful as benzedrine. The sodium barbiturates were "psycholeptic," producing a lowering of intra-psychic tensions, depressing the psychological tone; methedrine was "psychogogic," increasing intra-psychic tension and acting as a stimulant. Professor Delay was particularly interested in the psychosomatic effects of narco-analysis—that is to say, the exploration of the somatic behaviour, the emotional language of the *soma* as evidenced by tics, coughs, praecordial pain, and other manifestations.

Manic and depressive states could be relieved for short periods by sodium amytal.

A stuporous woman aged 42 was brought to hospital following an attempt at suicide. She was completely mute. When given methedrine she became agitated, cried, and with dramatic gestures declared that she had murdered her child. After a few hours the stuporous condition returned. Three days later she was given sodium amytal, and there was complete disappearance of all anxiety. Her mood was one of happiness and warmth. She was now able to give an account of her melancholic state, and she knew that she had not killed her child. By the use of both drugs the underlying pattern of ideas was discovered.

Sodium amytal, by decreasing the anxiety, enabled the patient to externalize the problem, while methedrine, by increasing the anxiety, forced its production. In schizophrenia, Professor Delay said, the presence or absence of catatonic features was important. These, when present, diminished in intensity with sodium amytal, but became more marked with methedrine. When not apparent, methedrine might bring them to light, whereas sodium amytal had no such effect, but facilitated contact with the patient. Psychological tests showed likewise the different actions of these two drugs.

Neurotic States

In the acute neuroses methedrine was of value diagnostically, but even more so therapeutically, its action being rapid and effective where emotional abreaction was the basis of cure. It appeared to be particularly valuable in exploring thoughts already present in consciousness but not freely expressed, whereas sodium amytal was more effective in revealing unconscious forces and in relieving amnesic states. Given together, the results were striking. In other words, methedrine was more useful in those cases in which the patient was unwilling to talk but knew unconsciously what to talk about, and sodium amytal was useful in cases where the patient was willing to talk but did not know what to talk about.

In chronic neurotic states the therapeutic results were not so good. The whole personality was much more deeply involved. Repeated sessions, with or without injections of these drugs, were necessary, since the problem was one of emotional re-education. Methedrine could be used only rarely, but through its "psychogogic" action it might be effective in externalizing conflicts where sodium amytal had failed. This was particularly true of psychasthenic states. There was, however, a risk of habit formation and addiction. Drug addiction could also be treated by combining methedrine and narco-analysis, methedrine being particularly useful in relieving the depressive symptoms resulting from the withdrawal of the addiction drug.

NUTRITION AND FERTILITY

NUTRITION SOCIETY CONFERENCE

A conference on "Nutrition and Fertility" was held on March 5 at the London School of Hygiene and Tropical Medicine, with Professor W. C. W. NIXON presiding.

Dr. J. HAMMOND, F.R.S., discussed the physiology of reproduction in relation to nutrition, and gave many examples of the interaction of endocrine systems, seasonal influences, and nutritional factors in farm animals. The predominant part played by the anterior pituitary in promoting growth and sexual development was emphasized; in cattle deficiency of vitamin A may affect growth indirectly by causing pituitary lesions. In animals with restricted breeding seasons the desire and ability to mate might be delayed either by poor general nutrition or by deficiency of some particular nutrient, but a rich diet, unlike exposure to light, could not bring on the breeding season before its usual time. Experiments on sheep indicated that adequate nutrition during the latter months of pregnancy was essential for the production of large, strong offspring; undernutrition during the early stages of pregnancy had no serious ill effects on the progeny.

Dr. A. WALTON commented on the wide variations in the amounts of semen produced by different animals, but considered that even in boars producing 750 ml. of fluid per week the loss of nutrients involved was quantitatively trifling, and did not include any unusual factors which could not readily be derived from a normal diet. Mr. J. EDWARDS said that there was little evidence to suggest that the diets given to bulls used in the artificial insemination service in this country were a limiting factor in determining their fertilizing power.

Dr. S. J. FOLLEY spoke on the influence of nutrition on female fertility, with particular reference to endocrine changes. Malnutrition might prevent the normal functioning of oestrus in rats by suppressing the development of the ovaries, which might, however, be stimulated into activity without improving nutrition by the administration of the appropriate hormones. Deficiency of vitamin E, commonly known as the "anti-sterility vitamin" on account of its action in preventing foetal death and resorption in rats, had been reported to cause injury to the pituitary gland. Malnutrition might also affect the metabolism of the sex hormones by preventing their inactivation. Thus in deficiency of vitamin B_1, or in cirrhosis of nutritional origin, the power of the liver to inactivate oestrogens was reduced. In herbivora, interference with fertility sometimes occurred through the ingestion of plants, such as subterranean clover, which contained oestrogenic factors. In this country the adverse effect exerted by spring pasture on the composition of cows' milk might possibly be due to the inclusion of plants with oestrogenic activity.

Malnutrition in Pregnancy

Professor A. St. G. HUGGETT said that experience in communities suffering severe dietary deprivations had shown that both the birth rate and the weight of the babies at birth were greatly reduced. In the siege of Leningrad, when the main item of the diet was 400 g. of bread daily, 50% of the babies weighed less than 2½ kg. at birth. In non-pregnant women severe malnutrition usually caused amenorrhoea. Deficiency of vitamin E in experimental rats brought about the termination of pregnancy, with death and resorption of the foetuses. Vitamin A deficiency also interfered with reproduction. Lack of this vitamin in pigs during the early stages of pregnancy sometimes caused congenital eye abnormalities, which recalled the observation that infection of the human mother with rubella during early pregnancy was often responsible for cataract in the child. Warkany had found that when rats were exposed to deficiency of riboflavin during the early stages of pregnancy their young, among other deformities, had cleft palates and defective ossification. Under-nutrition in the pregnant woman had one good effect in partial compensation for the reduced birth weight of the child; most authorities agreed that the incidence of toxaemia was greatly reduced.

Dr. G. J. M. SWYER pointed out that whereas in many Eastern countries chronic malnutrition was associated with fertility rates so high as to lead to serious over-population, in the West superior levels of nutrition were usually associated with much lower rates of reproduction. Social and economic restrictions might therefore be more important than limited food supplies in checking human reproduction. Experience in Russia, Holland, and Asia during the war, however, indicated clearly that grossly inadequate diets led to widespread amenorrhoea and loss of libido, with a great reduction in the conception rates. In communities where good nutrition was subsequently restored these defects were speedily corrected, while the conception rate tended to rise much above its normal level. The scanty menses and poor powers of reproduction sometimes found in unduly fat women, however, indicated that obesity, no less than semi-starvation, might hinder fecundity. Possibly the excessive fat deposits interfered with the action of oestrogens by removing them from the blood stream. Also obese women often had infections of the cervical canal with *B. coli*; it had been claimed that this condition might be cured, with substantial reduction in body weight, by the adoption of a diet in which sucrose was replaced by lactose. The failure to inactivate oestrogens in vitamin B deficiency might be of clinical importance in causing excessive uterine bleeding, cystic mastitis, and premenstrual tension. Claims that vitamin E was effective in combating male infertility had been contradicted by several workers, although it was possible that the doses given were inadequate. In regard to female fertility Bacharach had claimed that the combined results of early trials provided unequivocal statistical evidence of the value of the vitamin in the treatment of habitual abortion; no valid criticism of this conclusion had yet been advanced.

Mr. A. L. BACHARACH mentioned that the substitution of white flour for "national" flour in the diet of a rat-breeding colony caused anaemia and signs of vitamin E deficiency in the young. He had also noticed considerable seasonal variations in the animals' powers of reproduction which did not appear to depend on changes either in the environmental temperature or in the exposure to light. Dr. E. KODICEK commented on the importance of the "animal protein factors" for reproduction, and Dr. L. J. HARRIS recalled early work by Mapson in which liver was found to contain "physin," a factor which improved the growth of young rats if given to their mothers during pregnancy.

Professor NIXON, summarizing the day's proceedings, hoped that pregnant women would continue to avail themselves of the dietary supplements recommended officially and provided through the Ministry of Food.

INCOORDINATE UTERINE ACTION IN LABOUR

At a meeting of the Edinburgh Obstetrical Society held on Feb. 9, with the president, Dr. E. C. FAHMY, in the chair, Professor T. N. A. JEFFCOATE read a paper on incoordinate uterine action in labour.

Professor Jeffcoate criticized the use of the phrase "uterine inertia" in view of the fact that many cases of incoordinate uterine action were associated with high muscle tone, especially in the middle and lower zones, or with violent spasmodic contractions, or with a constriction ring. The clinical picture was one of prolonged labour with slow dilatation of the cervix, despite the presence of strong uterine contractions and the absence of gross disproportion. Pain was unusually distressing and was felt predominantly in the back. It sometimes assumed a bearing-down nature before full dilatation of the cervix and in such circumstances appeared to arise as a result of spasm of the lower bowel. All degrees of the condition might be found, and, although he had defined it for the purposes of his present paper as developing in the absence of disproportion, yet there was no doubt that, when disproportion was present, incoordinate action of the uterus was particularly prone to occur as a complicating feature.

Professor Jeffcoate then reviewed 101 cases, 62 seen in private practice and 39 in hospital. The incidence in hospital cases was 0.6%. The condition was observed more often in private practice, but it was not possible to work out any very reliable figures of its incidence. The disease was almost entirely confined to primigravid patients, but the aetiological influence of advancing age had been exaggerated. Premature rupture of the membranes did not appear to be a direct cause, occurring in only 22 cases, while the disordered action of the uterus was recognized before rupture of the membranes in 56 cases. Even when the membranes were unruptured the uterine disturbance was sometimes sufficient to affect the foetus. The significance of the occipito-posterior position as a cause of incoordinate action had been confirmed, and delayed engagement of the head in occipito-anterior positions was noted frequently.

The maternal and foetal dangers of this incoordinate uterine action had diminished as a result of the introduction of chemotherapy, better general care, caution over anaesthesia, and a readiness to resort to caesarean section late in labour. Nevertheless, the dangers were still present, although in the two series no mothers died and the foetal loss by stillbirth and neonatal death was no more than 12%. Professor Jeffcoate said that but for caesarean section the foetal mortality might have been in the neighbourhood of 50%.

Remote Prognosis

A further series of cases had been investigated by Professor Jeffcoate in respect of remote prognosis; 140 severe but non-fatal cases requiring caesarean section or forceps delivery during the years 1936–46 were collected, but unfortunately it had been possible to trace only 91. Of these women more than one-third had decided to avoid further pregnancy as a result of their experiences. Only one-half had had further pregnancies. There was little difference between the caesarean section group and that in which forceps had been used in regard to this voluntary infertility, but all the women who had lost their first children tried subsequently to conceive; contraception was practised only by those who had a living child. A few women embarked on a further pregnancy only when promised that subsequent delivery would be by elective caesarean section. In general terms the follow-up showed that in a large proportion of cases the behaviour of the uterus was much more efficient in the second labour, and that whereas caesarean section might be necessary in the first labour there was a good chance of vaginal delivery in the second. The ease of the second delivery appeared to be to some extent proportionate to the stage of dilatation reached by the cervix at the first labour. When full dilatation had been attained, the second labour was usually easy, even when the first baby had been delivered dead and with difficulty. It was therefore necessary to be cautious in advising elective caesarean section solely for "bad obstetric history."

In the management of disordered uterine action the administration of analgesics and antispasmodics, particularly morphine and pethidine, remained the chief line of attack. Professor Jeffcoate recorded generally disappointing results with the use of intravenous magnesium sulphate, of trinitroglycerin, and of oestrogens. After the intravenous administration of dilute solutions of oxytocin in glucose saline, as advocated recently by Theobald and others, two of Professor Jeffcoate's patients had suffered most severe pain without any change in the nature of the contractions, which remained incoordinate. Tetraethylammonium chloride had been tried in 11 cases, and had appeared in all to produce a strong and sustained uterine contraction, sufficient in one case to cause alarm for the foetus. When this contraction had passed off the patients experienced more frequent and apparently stronger uterine contractions for a period of up to one hour after the injection, but again there was no evidence of any alteration in the nature of the contractions, and in two cases constriction rings persisted.

Professor Jeffcoate briefly discussed the part played by nervous and emotional factors in the production of incoordinate uterine action. He was critical of the belief that fear and emotional tension were important in the aetiology in view of the fact that incoordinate uterine action did not recur in subsequent deliveries, even in those cases in which the first labour had been sufficient to daunt the stoutest heart. He thought that an unnatural resistance of the soft tissues of the lower part of the uterus might be found more important than neuromuscular imbalance resulting from fear. Professor Jeffcoate concluded by offering a classification of inefficient uterine action under the headings of (*a*) inertia proper, (*b*) incoordinate uterine action, and (*c*) cervical dystocia.

Professor Jeffcoate's paper was discussed by Dr. JOHN STURROCK, Dr. W. F. T. HAULTAIN, Professor KELLAR, Dr. HECTOR MACLENNAN, Dr. C. D. KENNEDY, Dr. T. M. ABBAS, Dr. J. A. CHALMERS, Dr. A. S. DUNCAN, Dr. W. I. C. MORRIS, and the president.

HEALTH CENTRES

In our account of a discussion on "Health Centres" at a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on March 7 (*Journal*, March 19, p. 494), Mr. W. T. DURNFORD, the architect, was misreported. Describing the new L.C.C. health centre at Stoke Newington, the architect is stated to have said that allowance would also be made there "for a certain number of private patients." What Mr. Durnford actually said was: "With 4,000 patients permitted at present, some overcrowding might result, but this number will no doubt be reduced in time, and the health centre was planned on the assumption that the number of registered patients per doctor might stabilize at 2,500, leaving a number of patients in the area to continue attending at private surgeries."

THE KING'S HEALTH

Uneventful Recovery

The following bulletin was issued from Buckingham Palace on Monday, March 21:

"The King's recovery from his operation has been uneventful. Instrumental tests have confirmed the substantial improvement in the blood-flow to the right foot, which had already been observed clinically after the operation."

MAURICE CASSIDY. J. R. LEARMONTH.
THOMAS DUNHILL. J. PATERSON ROSS.
HORACE EVANS. JOHN WEIR.

Correspondence

Occupational Diseases of the Lens and Retina

SIR,—Professor Grey Turner (March 19, p. 497) is not quite correct in saying that Dr. William Robinson's communication received a "lukewarm reception." It was largely due to it that glass-workers' cataract was added to the schedule of diseases notifiable under the Employers' Liability Act. The Glass-workers' Cataract Committee of the Royal Society, of which I was then secretary, made a special visit to Gateshead to interview Dr. Robinson on the subject.—I am, etc.,

Leeds. J. HERBERT PARSONS.

Classical Caesarean Section

SIR,—The lower-segment section was being performed at the Rotunda Hospital in 1909 when I was an assistant—i.e., 40 years ago. Professor J. Chassar Moir (March 5, p. 409) states it was introduced into "this country" 28 years ago. From an obstetrical point of view we consider that Great Britain and Ireland are one, and so I feel he is incorrect in the date he mentions for the introduction of the operation. Everyone agrees that the lower-segment operation should be done in nearly every case where caesarean section is indicated, but, as pointed out by several of your correspondents, there are exceptional instances where the classical operation must be the choice, and where the mentality of the obstetrician is still above suspicion.—I am, etc.,

Dublin. BETHEL SOLOMONS.

Proguanil and Falciparum Malaria

SIR,—The recent criticism of proguanil ("paludrine") as a therapeutic agent in falciparum malaria is tending to obscure the fact that the drug when used in adequate dosage does give rise to radical cure of many strains of *P. falciparum*.

Over the last three years in Liverpool we have treated many uncomplicated cases of falciparum malaria with proguanil without reinforcement (100 to 300 mg. proguanil twice daily for 10 days). The disappearance of the parasites and the subjective improvement of the patients have been satisfactory in all cases. Follow-up has been difficult owing to the fact that most of our patients have been merchant seamen, but following the recent work on the Lagos falciparum strain we made a special effort and have managed to trace the subsequent history of 30 patients, the majority of whom had primary infections contracted in West African ports ranging from Dakar to Victoria. Three of these were followed up for 6–7 months, ten for 8–24 months, and the rest for 2–4 years.

There have been no relapses after treatment. These figures are small, but they surely indicate that over a fairly wide range of strains falciparum infections respond well to adequate proguanil treatment and that the likelihood of relapse in a random sample of strains is small.

Sir Gordon Covell and his colleagues (Jan. 15, p. 88) have demonstrated the failure of proguanil to bring about radical cure in neurosyphilitics infected with the Lagos strain, and have pointed out that there is a good deal of other criticism of the drug in the treatment of falciparum malaria. Some of these failures with proguanil have resulted from the inadequate treatment originally recommended (as one of us (B.G.M.) observed particularly in British West Africa), but genuine failures have undoubtedly been reported. It may therefore be advisable in view of the serious nature of falciparum malaria to reinforce proguanil in routine treatment with mepacrine, as suggested, especially in areas such as the West Coast of Africa where there may be non-reactive or resistant strains—some of the latter possibly developing as the result of previous inadequate treatment. We believe, however, that in the majority of uncomplicated cases proguanil unaided will both cure the clinical attack and give rise to radical cure.

Sir Gordon Covell's comments (Jan. 29, p. 192) on your leading article on proguanil are fully justified. On suppressive and therapeutic dosage toxic side-effects are of no importance. In fact, as Afridi has pointed out, many patients have a very decided feeling of well-being while taking the drug.—We are, etc.,

B. G. MAEGRAITH.
W. H. H. ANDREWS.

Liverpool.

Treating the Aged Sick at Home

SIR,—I would like to draw your attention to a small omission in your excellent report (March 5, p. 408) of the recent meeting of the Medical Society for the Care of the Elderly.

When Dr. Brooke has received a report from his social worker he then arranges in many cases to meet the practitioner concerned to discuss the patient with him. Your report of the meeting gives the impression that the work is done by the social worker rather over the head of the general practitioner. I am sure this is neither the intention of the social worker nor the strict truth.—I am, etc.,

AMULREE,
Chairman of the Medical Society for the Care of the Elderly.

London, S.W.3.

Punch Prostatectomy

SIR,—It was refreshing to read the interesting article by Mr. H. T. Cox on punch prostatectomy (March 5, p. 386). As the writer states, it is a pity that transurethral resection has received so little attention in this country, and the reason undoubtedly is the difficulty of learning and teaching an operation where the operator alone has the operative field in view. Once the technique is mastered, however, a perfectly performed transurethral resection of the prostate gives great satisfaction to both patient and surgeon.

No other operation can offer the patient so many advantages, but I must stress that it must be done perfectly. I think it is a pity that Mr. Cox laid so much emphasis on the adjective "subtotal" in connexion with resection; the more completely the obstructing tissue is removed down to the prostatic capsule the better the results, and most of the poor results of transurethral resection, such as haemorrhage, sepsis, and "recurrence," can be attributed to tissue left behind. As he mentions, in poor-risk cases the operation can safely be done in stages until the capsule is exposed, so that it is very rarely necessary to do a permanent suprapubic cystostomy.

The mortality rate for transurethral resection of the prostate by the punch method at the Mayo Clinic has for many years been around 1%. While working in another private clinic in the United States I performed the operation on a series of over 100 cases with no deaths, but here in Newcastle-upon-Tyne, where we have a large proportion of poor-risk public cases, we have never bettered 4%. It is evident that the better physical state of the private cases goes far to influence results.

Modern transvesical and retropubic prostatectomy offer little hazard in good-risk cases, are easily learned, and are more readily available to the general surgeon. Transurethral resection, although a more highly specialized procedure, offers to both good and poor risks the advantage of a "non-cutting" operation, with shorter hospital stay and quicker convalescence.—I am, etc.,

Newcastle-upon-Tyne. JOHN SWINNEY.

Plasma-cell Mastitis

SIR,—May I comment on the recent correspondence in your columns on Dr. Max Cutler's article on plasma-cell mastitis (Jan. 15, p. 94) in order to make the point that the condition is rather an uncommon type of histological response in a common group of disorders of the breast, primarily involving the large ducts near the nipple and areola? The frequency of the disorders is to some extent concealed by the relative paucity of literature on the subject, probably due to the fact that the troubles they cause are often minor and self-limited.

If I may attempt to collect up some of the scattered threads, the underlying pathology would appear to be either atrophy of the breast at the menopause or hyperinvolution after lactation, so that the large ducts radiating from the nipple are left thinned and dilated. Sampson Handley had a beautiful illustration of the naked-eye morbid anatomical picture of the condition in his article on the breast in Choyce's *System of Surgery* (1932 edition), although concealed under the omnibus

title of "chronic mastitis." Sometimes the dilated ducts, while causing no symptoms, can be felt clinically, giving rise to the clinical picture which has been graphically described by Bloodgood[1] as varicocele of the nipple. Sometimes serous fluid accumulates in the dilated ducts; at other times the fluid and shed epithelium stagnant in the ducts tend to form an inspissated yellowish material, often resembling pus, which may discharge spontaneously or be expressed from the nipple. In either case the condition may lead to the patient presenting herself to the doctor as a case of discharge from the nipple.

Occasionally, but rarely, the inflammatory fibrosis around the stagnant ducts leads to retraction of the nipple—a feature which in the old terminology of breast disease used to be regarded as the exceptional example of the occurrence of nipple retraction in "chronic mastitis." In all the above examples there may be no palpable mass. But if there is sufficient inflammatory infiltration around the stagnant ducts a mass may be palpable clinically which has to be distinguished from other breast masses, if necessary by biopsy. The clinical picture is that of a predominantly periareolar mass, sometimes, but not always, with redness, tenderness, and other clinical inflammatory signs, the benign nature of which is often manifested by signs of its partial resolution.

There are two main histological pictures. The first is that of periductal mastitis,[2] of which Cutler's plasma-cell mastitis would appear to be a histological sub-variety. Mr. Colin D. L. Cromar (Feb. 26, p. 363) notes also the existence of intermediate grades in which plasma cells, although present, do not predominate. The other picture is one which Professor R. W. Scarff, of the Bland-Sutton Institute of Pathology of the Middlesex Hospital, has demonstrated to me both in personal cases and in those of colleagues; in this the inspissated, cheesy, and presumably fatty contents of the duct have burst through the degenerated duct wall and excited in the surrounding tissues similar histological reactions to those met with in fat necrosis —a picture apparently also noted by Mr. Cromar.

The above different clinical pictures may of course be combined, so that a single case may show, for example, both a nipple discharge, a mass, and nipple retraction. It is difficult to find a term to cover the whole group, but I would suggest that to emphasize the most important common pathological feature the term "duct stagnation" might be used. Suffixes such as "duct stagnation with periductal mastitis," "duct stagnation with periductal fibrosis," "duct stagnation with nipple discharge," might be added to emphasize the predominant clinical and pathological feature of the particular case.—I am, etc.,

London, W. DAVID H. PATEY.

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2 Geschickter, C. F., *Diseases of the Breast*, 1943. Philadelphia.

Blood Changes in Luminizers

SIR,—Dr. Ethel Browning (March 12, p. 428), in discussing blood changes in luminizers, makes the following statement:

"In the early stages the one consistent sign of overexposure is an absolute and progressive leucopenia, with a relative lymphocytosis causing an associated neutropenia or in some cases with a lymphopenia. This sign has been conspicuously absent in the luminizers examined between 1940 and 1947. The deviations in their blood picture suggest on the contrary a hyperstimulative effect, which appears to be produced by a mode of action entirely different from the depressive effect on the bone marrow of external gamma radiation."

Surely the findings of this paper are in accordance with the experience of all workers with *x* or gamma radiation. Chronic occupational exposure to these radiations produces the following effects on the blood:

1. The early responses are (*a*) an increase in the red cell count and in the haemoglobin value—both changes being very slight and associated with a slight rise in the colour index; and (*b*) little variation in the total white count but a relative lymphocytosis—up to 50% of the total white count. This early response is found in all workers with these radiations and occurs even if the radiation received is well within the accepted tolerance dose.

2. Later stages which occur include (*a*) leucopenia and a relative lymphopenia (when this occurs the worker should be removed forthwith from all exposure to any of these radiations); (*b*) still little change in the red cell count—the colour index being still slightly raised; terminally the red cell count and haemoglobin values fall, by which time the worker is probably doomed to a severe and rapidly progressive aplastic anaemia.

These changes emphasize the absolute necessity of performing regular white and red cell counts on every worker exposed to these radiations. Only by this means is it possible to differentiate a normal count from one which has previously shown the earliest stages of response to radiation and is now falling into the later and dangerous stage. There are so many variations in each individual person that again one must differentiate by these repeated counts minor variations due to intercurrent ailments.

The results of the survey by Dr. Ethel Browning surely indicate the efficiency of the measures taken to protect these luminizers from any harmful dosage of radiation. Had they shown absolute leucopenia or relative lymphopenia, then there would have been serious cause for alarm and revision of protective measures.—I am, etc.,

Worcester. ANTHONY A. VICKERS.

Ankylosing Spondylitis

SIR,—Dr. K. Sicher in his letter (March 12, p. 455) states, "The earlier the diagnosis is made the greater the success." He also emphasizes the value of a high total skin dose (2,500 r) of *x* rays. Our experience in the British Legion Unit of Rheumatology, and later when it became the Royal Free Hospital Unit of Rheumatology, is in full support of both these statements.

Drs. Gilbert Scott and F. Hernaman-Johnson (March 12, p. 456), and Dr. N. R. W. Simpson and Surgeon Lieutenant C. J. Stevenson (Feb. 5, p. 214), all advocate the value of early *x*-ray examination of the sacro-iliac joints. So diagnostically significant are the *x*-ray appearances that I recommended in a recent report to the Director-General of Health, New Zealand, that radiological changes in the sacro-iliac joints could be made a proper subject of notification. I gave the opinion that this course would ultimately lead to earlier recognition, and consequently earlier treatment, of this crippling disease—a disease which appears to select the most normal healthy physiques and youths for its inroads. It should ultimately be possible to bring the principles of mass radiography to the sacro-iliac joints of all recruits, and possibly other categories, and so arrest this disease in its most responsive phase.—I am, etc.,

London, W.1. C. B. HEALD.

Occupational Therapy

SIR,—In a review by Dr. Donald Stewart (March 5, p. 397) of a recently published book on occupational therapy the reviewer seems to have a misconception of the practice of occupational therapy. It is stated that "physiotherapists will be inspired to demand better accommodation and equipment . . . ", that "those sections of the book on the treatment of special disabilities will be of wide help to physiotherapists." Whereas the physiotherapists, except for a few doubly qualified people, have not got the knowledge to practise occupational therapy satisfactorily.

The physiotherapist is more concerned with individual or group muscular action rather than with the more widespread physiology which is embraced in the planning and completion of a complicated set of movements. It is the physical medicine specialist, the occupational therapist, or an interested physician who is more likely to be concerned in the principles of occupational therapy, and not the physiotherapist.—I am, etc.,

Edgware, Middlesex. J. D. THOMPSON.

Self-administered Trilene Analgesia

SIR,—I feel that Dr. R. W. Cope (March 12, p. 454) and others who oppose the use of "trilene" by midwives are unduly apprehensive. No therapeutic agent which is used to relieve pain can be said to be completely safe at all times and under all circumstances.

Gas-air machines can get out of order and give too high a proportion of gas to air, thus producing asphyxia. But cannot an apparently normal confinement "get out of order"? Does the midwife never have to send for medical aid? Even when the midwife sends for medical aid, does the young practitioner never ask the midwife what to do? I did many times, and was

very glad to take the midwife's advice. The midwife is trained to recognize the abnormal and to act skilfully in emergency.

We must acknowledge that the midwife is a colleague, and a very highly trained colleague too. She is not a half-witted subordinate, untrustworthy or unskilled. Most country doctors quite contentedly trust the midwife to administer chloroform anaesthesia for an instrumental delivery. And the country midwife soon becomes a very good anaesthetist from necessity. I have no doubt that there are far more fatalities during intravenous anaesthesia administered by a registered medical practitioner under favourable circumstances than occur under chloroform anaesthesia given by the midwife in country practice under most unfavourable conditions.

We are losing all sense of proportion in this argument as to what midwives should or should not use. The simple truth is that any recognized and well-established technique of pain relief is reasonably safe in the hands of those who have been trained to use it. It is equally unsafe in the hands of those who are untrained, be they medical practitioners, midwives, or motor drivers. Misfortune comes to the most skilful practitioner. In one hospital at which I worked two patients lost their arms following intravenous anaesthesia, given by a professional anaesthetist on the staff of a London teaching hospital, in a period of three months.

Having regard to the enormous increase in anaesthetic mortality and morbidity over the last twenty years we are in no position to throw stones at the midwives or to tell them that they are not to be trusted with pain-relieving drugs. Mr. F. Neon Reynolds (Sept. 25, 1948, p. 620, and Oct. 23, p. 671) and Dr. J. T. Hayward-Butt (Feb. 26, p. 364) have my support in strong measure.—I am, etc.,

New Barnet, Herts. JOHN ELAM.

Trilene in the Oxford Vaporizer

SIR,—Dr. P. S. A. Heyworth's memorandum (March 12, p. 441) on the use of "trilene" in the Oxford vaporizer in the hands of midwives is of great interest to those of us who after qualifying aspire to practise domiciliary obstetrics.

For forceps delivery and other procedures the use of chloroform appears to be universal amongst general practitioners to-day, carrying out the induction themselves and handing over to the midwife for maintenance. Yet, as a final-year student who has completed a course in anaesthetics, I have yet to use or see used a drug which is apparently to be my constant standby in the years to come; and this lack of experience is not for want of pestering my seniors for opportunities to become acquainted with it.

From the report on Dr. Heyworth's 1,400 obstetric cases in which trilene was administered in the Oxford vaporizer it seems that this technique may well enable those of us who lack experience of the "rag-and-bottle" to face obstetric procedures with as much confidence as our forerunners. Trilene is a drug which we have ample opportunities of using during our clinical training both for first-plane anaesthesia and for analgesia in obstetrics. If its limitations for domiciliary use—i.e., its low volatility—can be overcome by the use of the Oxford vaporizer, we have surely a versatile and portable addition to our armamentarium.

Another contributor to the *Journal* has spoken of fatalities due to vagal inhibition during trilene anaesthesia. That this may form the basis of an argument against allowing midwives to use the drug is admitted. But surely there can be no questioning the lethal potentialities of a chloroform bottle in the hands of an inexperienced practitioner, and it is for this reason—and with a very personal eye for the future—that I express the hope that Dr. Heyworth's technique will be given the widest possible trial.—I am, etc.,

London, W.2. JOHN A. RICHARDS.

Taking Children's Temperatures

SIR,—Being a Continental doctor I am astonished—and a little amused—about the discussion in the *British Medical Journal* on rectal temperature-taking. Nobody on the Continent—save perhaps a few "psycho-analysts"—would consider taking the temperature of small children anywhere else but in the rectum. "Nobody" does not refer to doctors only, but also to mothers of all classes, because "temperature-taking" on the Continent is part of a mother's task if the infant seems "off colour." Whenever a doctor is called to a young child he is sure to ask the mother, "What is the temperature?" I have never met a mother who would either say that she has not a thermometer or that she does not know how to take the temperature or how to read it. That was a completely new experience for me when I started practising in this country.

But Continental mothers always take the "rectal" temperature of their young children. I do not suppose that a baby who has all his bodily needs cared for by the mother (including the care of his anal region) would perceive this act as "uncalled-for interference with parts which he prefers to be left alone."

For a young child, his several bodily orifices are of similar importance and of similar "sentimental" value. But things put in the mouth are expected to provide some sort of satisfaction in so far as they can be sucked and swallowed. From this point of view a thermometer proves a very unsatisfactory and frustrating instrument if put into the mouth and is far more likely to create a psychological upset than if it were inserted into the anus, where it only evokes the desire for expulsion, which will—after one or two minutes—be satisfied.—I am, etc.,

London, N.W.3. LISE GELLNER.

Sexual Offenders

SIR,—The Report of the Joint Committee on Psychiatry and the Law appointed by the B.M.A. and the Magistrates' Association (*Supplement*, March 12, p. 135) is valuable inasmuch as it gives official recognition to what psychiatrists have stated for years. For example, I wrote in my book nine years ago:

"We would seriously state that imprisonment aggravates rather than cures homosexuality. Firstly, we have shown by the work of Jenkins that segregation from the opposite sex in rats tends to produce homosexual reactions and that these reactions do not always disappear after restoration of normal conditions. We have, however, much stronger evidence that such segregation is harmful. For example, Fishman investigated the sexuality of a prison population and found that as many as 30–40% were homosexual. He stated that the worst thing was that many young men reacted to prison by being initiated, in the abnormal atmosphere, into homosexuality. Although we have no statistics, experience of homosexual patients who have served prison sentences is that no improvement in their illness or behaviour results without psychotherapy."

It is nice to have official, if tardy, recognition of such facts. It is a pity, however, that the medical members did not have wider experience of the practical problems of paraphilia; their views appear to be based on theoretical rather than practical knowledge. For example, they perpetrate the old view that endocrine abnormality may be the basis of homosexuality. There is absolutely no evidence that this is so, although glandular disease may be a minor concomitant. The committee mentions "true perversion," but what is meant? It omits to define what entity it is describing. Neither is it stated what is supposed to be an "apparent perversion" or a "minor perverse trait." It implies that these supposed entities (which are extremely doubtful) can be differentiated by the ease with which they respond to treatment. Yet I have cleared up what has appeared to be a "true perversion"—if by that the writers mean someone who obtains sexual pleasure in an unbiological manner (i.e., without the possibility of fertilization because of abnormal relationship)—in a few sessions, whereas what has appeared to be an "apparent perversion" has proved obstinate and difficult.

The statement that treatment rather than imprisonment is the best thing for both the public and the offender is one with which everyone must agree. The problem from the practical point of view is, however, that there are so few places where it can be obtained. The ordinary psychiatric out-patient department is most unsuitable, and the few clinics where psychotherapy is available are overwhelmed with neurotics. In any case the treatment of the pervert is a specialized matter. If he cannot afford private treatment it is almost impossible for him to be cured.

I think that the time has come when an institute of psychosexual diseases should be established in London and these unfortunate people be given a real chance of cure. Otherwise

it is but a case of punishing a man for being ill without giving him the means of being cured. If I may alter Omar Khayyám:

> Oh, Thou, who didst with Pitfall and with Gin
> Beset the Road I was to wander in,
> Thou wilt not with stern Legislation round
> Enmesh me, and impute my Fall to Sin?

—I am, etc.,

London, W.1. CLIFFORD ALLEN.

Institute of Social Psychiatry

SIR,—May I draw your attention to the fact that in your leading article on Group Psychotherapy (Feb. 5, p. 227) you made no reference to the pioneer work or publications of the Institute of Social Psychiatry?

This Institute is the outcome of the work carried out by Dr. J. Bierer and others during the last two or three years. A book entitled *Therapeutic Social Clubs* was published for the Institute of Social Psychiatry by H. K. Lewis & Co., Ltd.; it was edited by Dr. J. Bierer and contained an introduction by Dr. E. B. Strauss. The following articles have also been published:

"Psychotherapy in Mental Hospital Practice" (*J. ment. Sci.*, 1940, **86**, 928), "Group Psychotherapy" (*British Medical Journal*, 1942, **1**, 214), "A New Form of Group Psychotherapy" (*Ment. Hlth Lond.*, 1944, **5**, 23), by Dr. J. Bierer; "Group Psychotherapy of War Neurosis" (*Lancet*, 1943, **1**, 204), by Dr. D. Blair; and "Mass Psychotherapy" (*Lancet*, 1940, **2**, 769), by Dr. E. N. Snowdon.

No reference was made in your leader to any of the above, which, as you will note, are amongst the earliest publications on this subject, but I feel sure that this must be an oversight on the part of the writer and that he would not wish to exclude mention of some of the pioneer work in this field in England.—We are, etc.,

JULIAN SNOW,
Hon. Secretary, Board of Governors, Institute of Social Psychiatry.
NOEL HARRIS,
Chairman, Academic Committee, Institute of Social Psychiatry.

London, N.W.3.

Anuria

SIR,—I thank Dr. J. F. Heggie (March 12, p. 454) for replying to my letter (Feb. 12, p. 282); but he thinks I have misread him and thus misinterpreted his meaning. I quoted him accurately, and I thought sufficiently; but even now he does not answer my criticism. He states that the intralobular arteries are "very fine straight branches," whereas the interlobular arteries in the juxtamedullary region of the cortex are large, so that when a vasoconstriction occurs the former are the more affected.

This is not an explanation: it is a statement, and I query the statement. And he creates a difficulty. He writes: "This abrupt division of comparatively large arteries into very small ones which are really end-arteries (since they give off the afferent glomerular arterioles) provides for the relatively high pressure necessary for filtration in the glomerular vessels." But I should have thought that if a relatively high pressure of moving blood within glomerular capillaries is necessary for the appearance of water in Bowman's capsules the arteries and arterioles supplying those glomeruli would have been relatively big, and the juxtamedullary interlobular arteries (or the arterioles in which *I suppose* they end), supplying juxtamedullary glomeruli (often degenerate, according to Trueta and his co-authors[1]), would have been relatively small.

Unfortunately Dr. Heggie has not referred to the second part of my letter in which I pointed out, quoting Brodie, that the secretion of urine has a profound effect on the flow of blood through the kidney. It is the key to an understanding of puerperal anuria and to the very marked oliguria of eclampsia, as I showed in a paper published in 1929.[2] In that I stated that "the distension of the cortical tubules is the primary change." Evidence of this was given on Jan. 21, 1949, at a meeting of the Section of Obstetrics of the Royal Society of Medicine, when sections of the kidney from two different cases of puerperal anuria obtained from the living patient were displayed on the screen: the distension of the cortical tubules was the overwhelming feature. This demonstrates that the anuria is not due to a primary constriction of peripheral cortical arterioles—the urine comes from the blood, and if no blood reaches the glomeruli and the tubules no urine can be formed and no distension of tubules could occur. There is another point to mention. On March 2, 1949, at a meeting of the Section of the History of Medicine at the Royal Society of Medicine, Professor Winton stated he had repeated Brodie's experiments and had confirmed his results: he also made some other valuable statements bearing on this question.

The evidence is—and successful treatment supports it—that cortical necrosis occurring in association with puerperal anuria is simply the result of an intrarenal obstruction to the exit of urine. Obviously if the kidney is so compressed that the urine formed in the cortex cannot traverse Henle's tubules, with their hairpin corners in the medulla, the same effect as that caused by clamping the ureter in the experimental animal (or by its ligation in man) will occur—the kidney will become almost bloodless. That such a compression of the kidney occurs in concealed accidental haemorrhage obstetricians may perhaps allow. It is the primary change. After delivery (emptying the uterus) other forces operating within the kidney, to which I referred in my 1929 paper, come into play, explaining the tendency of the anuria to persist.—I am, etc.,

Rugby. R. H. PARAMORE.

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Renal Lesions Associated with Pregnancy

SIR,—In your report of the meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine (Feb. 12, p. 281), I am quoted as describing the morbid anatomy of "uraemic cortical necrosis." I should like to point out that I never used this phrase, and, in consideration of the context of your report, the term "lower nephron nephrosis" should be substituted. Since I argued that bilateral cortical necrosis and lower nephron nephrosis were distinct pathological entities the distinction is of some importance.—I am, etc.,

London, E.1. J. F. SMITH.

POINTS FROM LETTERS

Occupational Therapy and Physiotherapy

Mrs. Z. C. GROUNDES-PEACE (Edinburgh, 4) writes: I read with interest the review by Dr. Donald Stewart of *Principles of Occupational Therapy* by Willard and Spackman (March 5, p. 397). I am glad to learn of his enthusiasm for work of this nature. It is, however, somewhat discouraging to realize that even he fails to appreciate the distinction between occupational therapy and physiotherapy. This is clear from his suggestion that "the author's description of the ideal organization of a hospital department of occupational therapy may well inspire physiotherapists in Great Britain to demand better accommodation and equipment and a more important place in the hospital hierarchy." May I call your readers' attention to the fact that in Great Britain there are separate training schools both for occupational therapists and physiotherapists, and that a diploma in occupational therapy is awarded after satisfactory completion of a course of 2½–3 years' duration at a training school recognized by the Association of Occupational Therapists in England and the Scottish Association of Occupational Therapists in Scotland?

Value of Clinical Records

Mr. GEORGE JENNINGS (Huddersfield) writes: The greatest experiments in the realm of medicine are conducted by clinicians—G.P.s and specialists—in the treatment of their patients. In many of our hospitals, owing to inadequate records and classification, invaluable evidence is lost every day—evidence which in the hands of competent investigators might be of inestimable value in assessing the value of treatment. In planning surgical treatment one is continually wondering what would be the fate of, say 1,000 patients in ten years if such and such a treatment were carried out. It is idle to theorize or to plan purely according to mechanical considerations when the answer to such a question should be available. Every patient undergoing an operation should have an account of his complaints and clinical condition; a special operation form attached to the above notes must contain the pathological findings and nature of the operation. Reports of *x*-ray and laboratory findings should be appended. If this can be done, provided no attempt be made to turn the house-surgeon into a clerk, then untold advantages may accrue. Encouragement would be given to the writing of good notes, surely the handmaiden of good clinical work. This matter should surely be planned and executed on a national basis by the profession.

Obituary

J. R. T. CONNER, M.D.

Dr. J. R. CONNER, who was editor of the *Clinical Journal* for more than thirty years, died on March 16 at the age of 87. John Richard Tarrant Conner was a student at Queen's College, Cork, and St. Thomas's Hospital. He took his M.D. with honours in 1882, and from then onwards his chief interests lay in medical journalism. For over thirty years he was in sole editorial control of the *Clinical Journal*. He pursued a policy of providing his general practitioner readers with articles and information that were essentially clinical and often written by well-known specialists. If he could not always obtain original articles he reprinted the best from other journals, and he abstracted widely and well under the heading of "Medical Progress." The standard he maintained was high. He was an individualist and knew just what he wanted. He had very definite ideas about how an article should be written, and used his blue pencil freely. Some of his contributors objected, but there could be no denying that by the time he had finished with it the article was improved. His indexing, of which he made a specialty, was a model of accurate detail.

Though he lived for the *Clinical Journal* he had other interests. For many years he was the London correspondent of the *Journal of the American Medical Association*, and he contrived to provide an informative column at almost weekly intervals. Many English readers of the *J.A.M.A.* found his "London Letter" one of its most interesting features. Latterly he had much to write about the working of the National Health Service Act, but he tended to allow his political sympathies to run away with his judgment. He was an uncompromising anti-socialist and a Southern Irishman who loved an argument. He must have enjoyed writing his last letters to America every bit as much as they were appreciated over there, for he recounted with vigour and obvious relish the teething troubles of the Act.

For a man of 87, J. R. Conner—he omitted the T. in his signature—was remarkably active both physically and mentally. He read widely and had a retentive memory. He was surprisingly well informed on trends and progress in modern medicine. To talk to him was to improve one's knowledge, and he delighted in making the long journey to the West End of London from his home in Greenford in order to meet and discuss things with a friend. He feared neither inclement weather nor the busiest traffic.

He died as he would have wished, suddenly and in full harness. He leaves a widow—a woman of Irish charm, who has been a great help to him—and a son.—W. B.

Dr. R. Y. Stones, Chester, writes: It is with sorrow that one heard of the passing of that great athlete and sportsman, A. W. Wakefield. In the obituary notice of March 19 (p. 504) no mention is made of his swimming. In this he was proficient, and represented his hospital and the United Hospitals Swimming Association, of which he was captain, in water-polo, diving, and racing. He was a member of the Amateur Diving Association. The tribute mentions that he was a severe disciplinarian. This discipline included sternness to himself, as was shown when he broke his olecranon through diving, I believe, into unexpectedly shallow water. He had the bone wired, and within a day or two he was boxing—"A. W.'s" method of preventing stiffness in the joint.

The Services

AUXILIARY R.A.M.C. FUNDS

The annual general meeting of members of the Auxiliary R.A.M.C. Funds will be held at 11, Chandos Street, London, W., on Monday, April 4, at 5.30 p.m., when the report and accounts for 1948 will be received and officers and auditors for 1949 appointed.

Colonel (Local Brigadier) A. G. Harsant, O.B.E., late R.A.M.C., has been appointed Honorary Surgeon to the King in succession to Colonel James Biggam, M.C., retired.

Medico-Legal

ACTION FOR NEGLIGENCE IN DIAGNOSIS

Mr. J. B. Hunter's Appeal Allowed

Mr. James Forbes Whiteford, an American citizen and a consulting engineer, was awarded £6,300 damages in an action[1] in which he alleged negligence against Mr. John Bowman Hunter, M.S., F.R.C.S., and Dr. Seymour R. Gleed, a medical practitioner of Finchley. Mr. Justice Birkett dismissed the action against Dr. Gleed, holding that no negligence could be attributed to him. Mr. Hunter subsequently appealed against the decision of Mr. Justice Birkett, and Mr. Whiteford cross-appealed against the dismissal of Dr. Gleed from the case. Mr. C. R. Havers, K.C., and Mr. Henry C. Dickens, instructed by Messrs. Hempsons on behalf of the Medical Defence Union, appeared for the defendants; Mr. Richard O'Sullivan, K.C., and Mr. Robert Fortune, instructed by Messrs. Billinghurst, Wood and Pope, for the plaintiff.

Lord Justice Asquith,[2] in allowing the appeal by Mr. Hunter, said that it was patent from the evidence that Mr. Hunter had been mistaken in his diagnosis of cancer of the bladder on April 5, 1942. It was not, however, every slip or mistake which imported negligence. It was alleged that Mr. Hunter was negligent in not verifying his diagnosis by cystoscopy or by biopsy. On the question of cystoscopy it appeared to the Court decisive that, once it had been decided on April 5 to open the plaintiff's bladder, cystoscopy became entirely unnecessary. On the question of biopsy Mr. Hunter had given three reasons for not resorting to this procedure. His Lordship discussed the arguments for and against biopsy in detail and took the view that Mr. Hunter was not negligent in his decision not to carry out biopsy. It followed that the appeal must be allowed.

Mr. Whiteford's cross-appeal against the dismissal of his action against Dr. Gleed, which had not been strongly pressed, was dismissed. Leave was given to appeal to the House of Lords.

A fuller account of this important judgment will appear in a subsequent issue.

[1] *British Medical Journal*, 1948, **2**, 537.
[2] *The Times*, March 22, 1949.

Medical Notes in Parliament

ANALGESIA IN CHILDBIRTH

On March 15 Mr. BEVAN asked the permission of the House to make a statement on analgesia in childbirth. The debate on the second reading of the Analgesia in Childbirth Bill, which was moved by Mr. Peter Thorneycroft on March 4, was reported in our issue of March 12 (p. 459).

The Minister of Health said that at the end of 1947 more than 7,000 of the 16,000 midwives then practising were trained in the administration of analgesia. During 1948 practising midwives were trained at the rate of 240 per month, and at this pace training would be completed in two years. If the Central Midwives Boards at any time considered that they needed to make further rules in the matter the boards already had ample powers in the Midwives Acts. The number of cases in which analgesia was administered by midwives had also increased greatly. In 1938 analgesia was administered by domiciliary midwives in England and Wales in less than 1,200 cases; in 1944 it was administered in 5,100 cases, while in 1947 domiciliary midwives were able to give this relief in almost 44,000 cases. Returns for 1948 were not yet complete, but those so far received showed that in the 72 areas to which they relate good progress was again made. In these areas analgesia was administered in 16,500 cases in the six months of 1948 during which the National Health Service was in operation as compared with 9,100 cases in the last six months of 1947. It was the Government's policy and determination to secure that full facilities were provided as quickly as possible for women to have analgesia in childbirth, and much progress had already been made. In so far as it was necessary to ensure that sufficient analgesic apparatus and drugs were provided for the use of domiciliary midwives employed in the

National Health Service, that the apparatus was maintained in a proper state of efficiency, and that facilities for transport were provided, he was satisfied that he had all necessary powers to place a duty on local health authorities in these matters.

Part III of the National Health Service Act required local health authorities to carry out a number of duties relating to local health services, including duties to make arrangements for the care of expectant and nursing mothers and to secure that sufficient midwives were available for attending domiciliary confinements. Local health authorities were further required to carry out these duties in accordance with proposals submitted to and approved by the Minister of Health or, in Scotland, the Secretary of State, who might before giving approval modify them and might at any time require the submission of revised proposals. In submitting their proposals for approval most local health authorities included provisions relating to analgesia. Where they did not do so, or the Ministry of Health thought the provisions were inadequate, the proposals were altered before being approved. Thus duties had already been imposed on local health authorities in this matter.

The National Health Service Acts had placed upon the Minister and the Secretary of State the duty of providing an adequate hospital service, and by reason of this duty an obligation rested upon them to see that proper arrangements were made for the administration of analgesia in their hospitals. Mr. Bevan added that he was sure that the views spoken with such sincerity in the recent debate would be carefully observed by those authorities, both local health authorities and hospital authorities, which were concerned with the care of women in childbirth, and would create in them also a determination to see that there was no delay or hindrance in making that full provision which was desired.

Mr. THORNEYCROFT thanked Mr. Bevan for his statement and gathered from it that the Minister did not regard the Analgesia in Childbirth Bill as necessary. Mr. Thorneycroft questioned whether it was possible by regulation to turn a permissive power into a public duty. The National Health Service Act did not prescribe a duty to provide an analgesia service. He declared he would endeavour to bring the Analgesia Bill into law.

Mr. BEVAN replied that there was no statutory limitation and therefore no need for statutory easement. Limitations were imposed by Nature, by resources, and by the state of medical knowledge. The Minister of Health and the Secretary of State had power to modify, change, and enlarge any duties imposed on local health authorities. That included power to impose the duty of using analgesic apparatus or any other apparatus medically useful in alleviating pain in childbirth. He was not prepared to select out of a general service one matter for priority.

Colonel STODDART-SCOTT asked whether the Minister intended to use his power to place on local authorities a duty in these matters. Was Mr. Bevan aware that one local authority in Wales—Newport—would not permit a midwife to have a motor-car ?

Mr. BEVAN said that in Newport the analgesic apparatus was sent by ambulance. The figure he had given of 240 midwives trained every month in the use of the apparatus was for Great Britain.

Colonel GOMME DUNCAN asked for the figures for Scotland.

Mr. WOODBURN said that in Scotland in most maternity cases doctors were available and had powers to use whatever methods were necessary for relieving pain.

Further Debate Suggested

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Mr. HERBERT MORRISON said Mr. Bevan had dealt with the matter. Mr. Morrison thought the Minister's statement fully justified. He did not think there would be any advantage in a debate.

Mrs. MANNING pointed out that Government supporters were associated with the Bill and had not withdrawn their names from the motion.

Mr. MORRISON, continuing, said he could not add to what Mr. Blenkinsop and Mr. Bevan had said in previous discussions.

ARTIFICIAL INSEMINATION AND LEGITIMACY

Lord READING, in the House of Lords on March 16, called attention to the effects of recent judicial decisions on the legitimacy of children. He said the Matrimonial Causes Act of 1937 laid down that wilful refusal to consummate a marriage should be a ground for nullity. It also introduced as grounds on which a marriage could be declared null and void the ground that one of the parties had been of unsound mind when the marriage took place, or that one of the parties suffered from venereal disease at the time of the marriage, or, in the case of a woman, that she at the time of the marriage had been pregnant by some man other than the husband.

In a case brought in 1942, after the parties had lived together for thirteen years and a child had been born, a petition against the husband was met with the reply that the marriage had never been consummated in spite of the fact that a child had been born which by common consent was the child of the husband and the wife. The husband asked for a decree of nullity, and the judge came to the conclusion that the marriage had never been consummated by actual penetration and that the child had been conceived by an accidental process of fecundation from without. In a second case a child was conceived before the marriage but born after the marriage took place. Seventeen years later the husband filed a petition of nullity on the ground that the marriage had never been consummated because of the wife's wilful refusal. The judge made the decree, with the result that the child, then 17 years of age, was made a bastard.

Lord Reading then turned to the separate and more controversial issue of human artificial insemination. He believed it was increasingly practised, and he mentioned the case in November, 1948, of a woman married in 1940 to a man whom she found to be unable to consummate the marriage. That woman, towards the end of 1947, had herself artificially impregnated with the husband's consent and through his agency. She left him in January, 1948, and in September a child was born. Two months later a decree of nullity was granted on the ground of the husband's incapacity. There had been no penetration, but there was a child of the father and the mother, yet the decision of the judge to grant a decree was inevitable as the law stood. Artificial insemination by a donor raised even more complex questions. The view expressed by a legal authority that artificial insemination by a donor constituted adultery required further consideration. It would be an irrational situation if, after artificial insemination by a husband, a marriage could be annulled, whereas extra-marital intercourse of the same kind could be put foward as adultery. In the case of artificial insemination by a donor, whose name, in the declaration made of the birth of a child, was to be put in as the father ? It might be that a doctor would find himself involved in a charge of conspiracy as well as of perjury.

The position of the medical profession in this matter was one of immense delicacy and responsibility. He had seen it suggested that artificial insemination by a donor should be made a criminal offence. That would be a fatal error. It would drive the practice underground and force it into clandestine and uncontrolled use. He pressed the Government to appoint a Royal Commission or a Departmental Committee to go into every aspect of this difficult and debatable matter.

Lord BRABAZON OF TARA, who had a motion on the paper calling attention to the social problems resulting from human artificial insemination, referred to the document on the subject which had been issued under the authority of the Archbishop of Canterbury. He said it was axiomatic that a child born as a result of A.I.D. must be illegitimate as it was not the child of the two spouses ; but he cited a case in the Supreme Court of New York State in which the child had been declared legitimate and the husband the legal father. It appeared to Lord Brabazon that anyone who wished to be a donor must be a megalomaniac of the first order, and he did not think that in this country many would be found who would consent to be donors. He hoped that if they were discovered they would be ostracized. Children engendered by artificial insemination were as genuinely born as any others and should not be called "test-tube children." He thought it true that such a child was unlikely to suffer psychologically, but there were no real data on which to judge.

A.I.D. as a Criminal Offence

The Archbishop of Canterbury said artificial insemination was a practice far less widespread in this country than in the United States, but it was established here on a small scale. Artificial insemination by a husband was, on the whole, justifiable. Artificial insemination by a donor was contrary to Christian standards. All those concerned with A.I.D. accepted that the donor should remain unknown to anybody but the doctor concerned, but when the child was registered and the nominal father registered himself as the real father that was a criminal offence under the Perjury Act, 1911, for which a sentence of seven years' imprisonment might be imposed. This falsity in the declaration of paternity raised legal points connected with titles, estates, interests, or funds. Either the law must be altered to allow relief from perjury to the nominal father or A.I.D. should be made a criminal offence. The doctor assisted at an act which to his knowledge would involve perjury. The Archbishop was perturbed that the Medical

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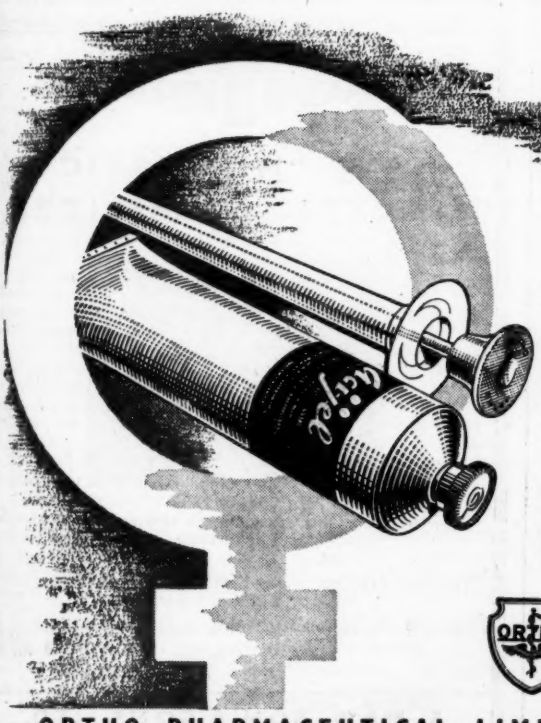

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1. Am. J. Obst. E. Gyn., 45:1, 1943.
2. Texas State J. Med., 39:1, 1943.
3. J. Tennessee M.A., 35:455, 1942.
4. Med. World, 58:562, 1940.
5. Am. J. Obst. E. Gyn., 52:1, 1946.

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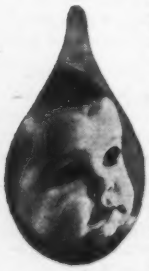

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Defence Union should have given advice to medical practitioners concerned in this practice on how to protect themselves professionally against adverse legal consequences to themselves in connexion with this practice. If A.I.D. were made a criminal offence, then no doctor could employ it without losing his professional standing and without himself becoming liable to charge. The only effective way to prevent the practice was to forbid the doctor to employ it. Commenting on a recent case in the Probate and Divorce Division, the Archbishop said that presumably any couple who had children born by A.I.H. and *a fortiori* by A.I.D. could get a nullity decree if they desired it. He contended that where through the impotence of one party there was a mutual surrender of the reproductive organs, though not of the sexual organs, that, surely, was consummation of the marriage. By the same argument, A.I.D. was adultery. Lord Dunedin in *Russell* v. *Russell* had said fecundation *ab extra*—from another party—was adultery. The suggestion that A.I.D. should be employed to enable unmarried women to bear children was on all grounds to be rejected. The only two countries which had in recent times encouraged this practice were Nazi Germany and Soviet Russia. In the interests of society, of the family, and of the child A.I.D. should not be permitted. The practice became yet more degrading when the semen was derived from what the Medical Defence Union described as a "bureau" or "bank."

Fraud and Secrecy

Lord MERRIMAN said sexual intercourse, in the ordinary sense of the word, was necessary to constitute adultery. How far it proceeded was another matter, but the man and the woman must be personally concerned. A whole range of cases showed that adultery might be regarded as proved though penetration must have been very slight. Once the court got to a state of doubt created by evidence of virginity, a heavy additional burden was thrown on a husband who asserted that adultery had been committed. Artificial insemination was increasing and ought to be diminished. What was to happen in the next generation? The Medical Defence Union said it was prepared to limit the number of inseminations from one donor at one time to 100. This meant that in the practice of one doctor a man might sire 100 boys and girls at one time. What was to happen when these half-sisters and half-brothers fell in love with each other twenty years later? The whole essence of A.I.D. was fraud and secrecy. The undertaking exacted by the Medical Defence Union that no question of property was involved was not worth the paper on which it was written. The sooner the medical profession became aware that by lending themselves to false statements in the register they might become liable to a charge of common law misdemeanour or of conspiracy the better it would be.

Replying to the debate, Lord CHORLEY said that the situation which existed under the Act of 1937 called for treatment. On the other hand, questions of property rights and all sorts of other problems were involved and he would be wrong to undertake that immediate legislation would be introduced. By those who advised the Government on legal problems it was regarded as far from clear that artificial insemination by an outside donor amounted to adultery. The Government agreed with the view that to make A.I.D. a criminal offence would drive it underground. At present the practice was being pursued under medical supervision, which was probably the best which could be devised. To make it a criminal offence would shock a large number of people. The problem was dominated by the question of fertility in marriages, and till the Report of the Royal Commission on Population was published, which would probably be in the next few months, it was impossible to come to any satisfactory conclusion on this matter. Until the Government got that Report it would be wrong to set up a new Royal Commission or Departmental Committee. The Lord Chancellor, Lord Chorley said, thought that questions of legitimacy and inheritance arising from artificial insemination would not be numerous and would be most satisfactorily dealt with by the courts as they arose.

Lord READING remarked that he had seldom heard a more unsatisfactory answer given to a serious debate in the House of Lords.

Lord ADDISON promised that without delay consideration would be given to what had been said in the debate.

Exchange Control Medical Advisory Committee

Colonel STODDART-SCOTT said on March 14 that treatment for some diseases could not be obtained in this country. From time to time medical pioneers who worked abroad were prepared to undertake cases which lesser men would give up as incurable. When a doctor or specialist decided that the only treatment which would do good was treatment in a foreign country the patient then had to apply to the Exchequer for permission to receive foreign exchange; 914 cases were refused foreign currency for treatment abroad in 1948 although that treatment had been recommended by a doctor or a specialist. The Chancellor always said that he had been advised by the Exchange Control Medical Advisory Committee that foreign currency should not be granted. This committee included ten medical members who each received yearly for their services £500. The House had never been told who composed the committee. Was the reason that it was composed of medical nonentities? Probably it was composed of distinguished consultants. If they were distinguished consultants, why did the country not know who they were? Disclosure would reduce the unrest among members of the medical profession, who disliked to see their recommendations, made after full investigation and examination, turned down by a committee which had never seen the patient.

Mr. DOUGLAS JAY, replying for the Treasury, said there was no question of refusing currency to anyone who as a result would improve his chances of recovery. The question was how to decide which individuals fell into that category. In running an exchange control system that decision had to be made and the Treasury could not make it. The objection to letting the doctor of the individual make the decision was not that anyone questioned the medical facts stated by the patient's doctor. The Exchange Control Medical Advisory Committee accepted those facts from the doctor. Having accepted those facts, its function was to decide whether a case was established for the patient to travel to a specified country in order to obtain special treatment. They should apply common standards in deciding what medical facts justified the journey suggested. The suggestion that the committee should see the patient misconceived the committee's functions. That would be a checking of the veracity of the statement made by the patient's doctor. Experience before the present arrangement came into force had given little evidence that common standards would be applied without the procedure of the Advisory Committee.

The previous system had led to abuses which were liable to cost a great deal in foreign exchange, and some check had to be introduced. The present check was working well. The Advisory Committee consisted of ten leading specialists in tuberculosis and other diseases in addition to the chairman and secretary. The names had not been given because that was not the desire of the medical profession or of the members of the committee. Every case was studied by two members of the committee, who in the event of disagreement referred it to the chairman, and the fact that the committee as a whole had not met in a certain period was irrelevant. The committee was always willing to reconsider any case if fresh medical evidence was brought forward. Figures showed the cases were dealt with in a sympathetic manner. For many of these cases treatment was available within the sterling area. In 1948 2,907 applications had been made and nearly 2,000 were granted; of tuberculosis cases 101 were refused and 1,009 were granted.

Colonel STODDART-SCOTT then contended that the only way to avoid abuse was for every patient to be seen, and he said that the committee if it failed to see a case was sure to make mistakes.

Mr. JAY remarked that Colonel Stoddart-Scott was impugning the veracity of the medical profession by implying that the diagnosis of the patient by the ordinary practitioner could not be relied on. He thought that in the great majority of cases one could rely on the ordinary doctor for statements of fact.

Hospital Accommodation in Northern Ireland

In the Northern Ireland Parliament last week Mr. HANNA asked the Minister of Health and Local Government whether he could state the total number of beds available for patients in general hospitals in Belfast and Northern Ireland at the date of the coming into operation of the Health Services Act and at the present time.

The Minister replied that on July 5, 1948, the total number of beds available in general hospitals vested in the Northern Ireland Hospitals Authority was: Belfast, 3,170 beds; Northern Ireland, excluding Belfast, 3,204 beds. The total number of beds available in general hospitals on March 10 was: Belfast, 3,280 beds; Northern Ireland, excluding Belfast, 3,344 beds.

Lepers in Nigeria.—It is estimated that there are about 400,000 lepers in Nigeria; 37,000 are receiving hospital and similar treatment; 33,000 are out-patients. Leprosy is compulsorily notifiable only in districts proclaimed under the law governing the isolation and detention of lepers.

National Health Service, that the apparatus was maintained in a proper state of efficiency, and that facilities for transport were provided, he was satisfied that he had all necessary powers to place a duty on local health authorities in these matters.

Part III of the National Health Service Act required local health authorities to carry out a number of duties relating to local health services, including duties to make arrangements for the care of expectant and nursing mothers and to secure that sufficient midwives were available for attending domiciliary confinements. Local health authorities were further required to carry out these duties in accordance with proposals submitted to and approved by the Minister of Health or, in Scotland, the Secretary of State, who might before giving approval modify them and might at any time require the submission of revised proposals. In submitting their proposals for approval most local health authorities included provisions relating to analgesia. Where they did not do so, or the Ministry of Health thought the provisions were inadequate, the proposals were altered before being approved. Thus duties had already been imposed on local health authorities in this matter.

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Lord READING, in the House of Lords on March 16, called attention to the effects of recent judicial decisions on the legitimacy of children. He said the Matrimonial Causes Act of 1937 laid down that wilful refusal to consummate a marriage should be a ground for nullity. It also introduced as grounds on which a marriage could be declared null and void the ground that one of the parties had been of unsound mind when the marriage took place, or that one of the parties suffered from venereal disease at the time of the marriage, or, in the case of a woman, that she at the time of the marriage had been pregnant by some man other than the husband.

In a case brought in 1942, after the parties had lived together for thirteen years and a child had been born, a petition against the husband was met with the reply that the marriage had never been consummated in spite of the fact that a child had been born which by common consent was the child of the husband and the wife. The husband asked for a decree of nullity, and the judge came to the conclusion that the marriage had never been consummated by actual penetration and that the child had been conceived by an accidental process of fecundation from without. In a second case a child was conceived before the marriage but born after the marriage took place. Seventeen years later the husband filed a petition of nullity on the ground that the marriage had never been consummated because of the wife's wilful refusal. The judge made the decree, with the result that the child, then 17 years of age, was made a bastard.

Lord Reading then turned to the separate and more controversial issue of human artificial insemination. He believed it was increasingly practised, and he mentioned the case in November, 1948, of a woman married in 1940 to a man whom she found to be unable to consummate the marriage. That woman, towards the end of 1947, had herself artificially impregnated with the husband's consent and through his agency. She left him in January, 1948, and in September a child was born. Two months later a decree of nullity was granted on the ground of the husband's incapacity. There had been no penetration, but there was a child of the father and the mother, yet the decision of the judge to grant a decree was inevitable as the law stood. Artificial insemination by a donor raised even more complex questions. The view expressed by a legal authority that artificial insemination by a donor constituted adultery required further consideration. It would be an irrational situation if, after artificial insemination by a husband, a marriage could be annulled, whereas extra-marital intercourse of the same kind could be put foward as adultery. In the case of artificial insemination by a donor, whose name, in the declaration made of the birth of a child, was to be put in as the father ? It might be that a doctor would find himself involved in a charge of conspiracy as well as of perjury.

The position of the medical profession in this matter was one of immense delicacy and responsibility. He had seen it suggested that artificial insemination by a donor should be made a criminal offence. That would be a fatal error. It would drive the practice underground and force it into clandestine and uncontrolled use. He pressed the Government to appoint a Royal Commission or a Departmental Committee to go into every aspect of this difficult and debatable matter.

Lord BRABAZON OF TARA, who had a motion on the paper calling attention to the social problems resulting from human artificial insemination, referred to the document on the subject which had been issued under the authority of the Archbishop of Canterbury. He said it was axiomatic that a child born as a result of A.I.D. must be illegitimate as it was not the child of the two spouses ; but he cited a case in the Supreme Court of New York State in which the child had been declared legitimate and the husband the legal father. It appeared to Lord Brabazon that anyone who wished to be a donor must be a megalomaniac of the first order, and he did not think that in this country many would be found who would consent to be donors. He hoped that if they were discovered they would be ostracized. Children engendered by artificial insemination were as genuinely born as any others and should not be called "test-tube children." He thought it true that such a child was unlikely to suffer psychologically, but there were no real data on which to judge.

A.I.D. as a Criminal Offence

The Archbishop of Canterbury said artificial insemination was a practice far less widespread in this country than in the United States, but it was established here on a small scale. Artificial insemination by a husband was, on the whole, justifiable. Artificial insemination by a donor was contrary to Christian standards. All those concerned with A.I.D. accepted that the donor should remain unknown to anybody but the doctor concerned, but when the child was registered and the nominal father registered himself as the real father that was a criminal offence under the Perjury Act, 1911, for which a sentence of seven years' imprisonment might be imposed. This falsity in the declaration of paternity raised legal points connected with titles, estates, interests, or funds. Either the law must be altered to allow relief from perjury to the nominal father or A.I.D. should be made a criminal offence. The doctor assisted at an act which to his knowledge would involve perjury. The Archbishop was perturbed that the Medical

Defence Union should have given advice to medical practitioners concerned in this practice on how to protect themselves professionally against adverse legal consequences to themselves in connexion with this practice. If A.I.D. were made a criminal offence, then no doctor could employ it without losing his professional standing and without himself becoming liable to charge. The only effective way to prevent the practice was to forbid the doctor to employ it. Commenting on a recent case in the Probate and Divorce Division, the Archbishop said that presumably any couple who had children born by A.I.H. and *a fortiori* by A.I.D. could get a nullity decree if they desired it. He contended that where through the impotence of one party there was a mutual surrender of the reproductive organs, though not of the sexual organs, that, surely, was consummation of the marriage. By the same argument, A.I.D. was adultery. Lord Dunedin in *Russell* v. *Russell* had said fecundation *ab extra*—from another party—was adultery. The suggestion that A.I.D. should be employed to enable unmarried women to bear children was on all grounds to be rejected. The only two countries which had in recent times encouraged this practice were Nazi Germany and Soviet Russia. In the interests of society, of the family, and of the child A.I.D. should not be permitted. The practice became yet more degrading when the semen was derived from what the Medical Defence Union described as a "bureau" or "bank."

Fraud and Secrecy

Lord MERRIMAN said sexual intercourse, in the ordinary sense of the word, was necessary to constitute adultery. How far it proceeded was another matter, but the man and the woman must be personally concerned. A whole range of cases showed that adultery might be regarded as proved though penetration must have been very slight. Once the court got to a state of doubt created by evidence of virginity, a heavy additional burden was thrown on a husband who asserted that adultery had been committed. Artificial insemination was increasing and ought to be diminished. What was to happen in the next generation? The Medical Defence Union said it was prepared to limit the number of inseminations from one donor at one time to 100. This meant that in the practice of one doctor a man might sire 100 boys and girls at one time. What was to happen when these half-sisters and half-brothers fell in love with each other twenty years later? The whole essence of A.I.D. was fraud and secrecy. The undertaking exacted by the Medical Defence Union that no question of property was involved was not worth the paper on which it was written. The sooner the medical profession became aware that by lending themselves to false statements in the register they might become liable to a charge of common law misdemeanour or of conspiracy the better it would be.

Replying to the debate, Lord CHORLEY said that the situation which existed under the Act of 1937 called for treatment. On the other hand, questions of property rights and all sorts of other problems were involved and he would be wrong to undertake that immediate legislation would be introduced. By those who advised the Government on legal problems it was regarded as far from clear that artificial insemination by an outside donor amounted to adultery. The Government agreed with the view that to make A.I.D. a criminal offence would drive it underground. At present the practice was being pursued under medical supervision, which was probably the best which could be devised. To make it a criminal offence would shock a large number of people. The problem was dominated by the question of fertility in marriages, and till the Report of the Royal Commission on Population was published, which would probably be in the next few months, it was impossible to come to any satisfactory conclusion on this matter. Until the Government got that Report it would be wrong to set up a new Royal Commission or Departmental Committee. The Lord Chancellor, Lord Chorley said, thought that questions of legitimacy and inheritance arising from artificial insemination would not be numerous and would be most satisfactorily dealt with by the courts as they arose.

Lord READING remarked that he had seldom heard a more unsatisfactory answer given to a serious debate in the House of Lords.

Lord ADDISON promised that without delay consideration would be given to what had been said in the debate.

Exchange Control Medical Advisory Committee

Colonel STODDART-SCOTT said on March 14 that treatment for some diseases could not be obtained in this country. From time to time medical pioneers who worked abroad were prepared to undertake cases which lesser men would give up as incurable. When a doctor or specialist decided that the only treatment which would do good was treatment in a foreign country the patient then had to apply to the Exchequer for permission to receive foreign exchange; 914 cases were refused foreign currency for treatment abroad in 1948 although that treatment had been recommended by a doctor or a specialist. The Chancellor always said that he had been advised by the Exchange Control Medical Advisory Committee that foreign currency should not be granted. This committee included ten medical members who each received yearly for their services £500. The House had never been told who composed the committee. Was the reason that it was composed of medical nonentities? Probably it was composed of distinguished consultants. If they were distinguished consultants, why did the country not know who they were? Disclosure would reduce the unrest among members of the medical profession, who disliked to see their recommendations, made after full investigation and examination, turned down by a committee which had never seen the patient.

Mr. DOUGLAS JAY, replying for the Treasury, said there was no question of refusing currency to anyone who as a result would improve his chances of recovery. The question was how to decide which individuals fell into that category. In running an exchange control system that decision had to be made and the Treasury could not make it. The objection to letting the doctor of the individual make the decision was not that anyone questioned the medical facts stated by the patient's doctor. The Exchange Control Medical Advisory Committee accepted those facts from the doctor. Having accepted those facts, its function was to decide whether a case was established for the patient to travel to a specified country in order to obtain special treatment. They should apply common standards in deciding what medical facts justified the journey suggested. The suggestion that the committee should see the patient misconceived the committee's functions. That would be a checking of the veracity of the statement made by the patient's doctor. Experience before the present arrangement came into force had given little evidence that common standards would be applied without the procedure of the Advisory Committee.

The previous system had led to abuses which were liable to cost a great deal in foreign exchange, and some check had to be introduced. The present check was working well. The Advisory Committee consisted of ten leading specialists in tuberculosis and other diseases in addition to the chairman and secretary. The names had not been given because that was not the desire of the medical profession or of the members of the committee. Every case was studied by two members of the committee, who in the event of disagreement referred it to the chairman, and the fact that the committee as a whole had not met in a certain period was irrelevant. The committee was always willing to reconsider any case if fresh medical evidence was brought forward. Figures showed the cases were dealt with in a sympathetic manner. For many of these cases treatment was available within the sterling area. In 1948 2,907 applications had been made and nearly 2,000 were granted; of tuberculosis cases 101 were refused and 1,009 were granted.

Colonel STODDART-SCOTT then contended that the only way to avoid abuse was for every patient to be seen, and he said that the committee if it failed to see a case was sure to make mistakes.

Mr. JAY remarked that Colonel Stoddart-Scott was impugning the veracity of the medical profession by implying that the diagnosis of the patient by the ordinary practitioner could not be relied on. He thought that in the great majority of cases one could rely on the ordinary doctor for statements of fact.

Hospital Accommodation in Northern Ireland

In the Northern Ireland Parliament last week Mr. HANNA asked the Minister of Health and Local Government whether he could state the total number of beds available for patients in general hospitals in Belfast and Northern Ireland at the date of the coming into operation of the Health Services Act and at the present time.

The Minister replied that on July 5, 1948, the total number of beds available in general hospitals vested in the Northern Ireland Hospitals Authority was: Belfast, 3,170 beds; Northern Ireland, excluding Belfast, 3,204 beds. The total number of beds available in general hospitals on March 10 was: Belfast, 3,280 beds; Northern Ireland, excluding Belfast, 3,344 beds.

Lepers in Nigeria.—It is estimated that there are about 400,000 lepers in Nigeria; 37,000 are receiving hospital and similar treatment; 33,000 are out-patients. Leprosy is compulsorily notifiable only in districts proclaimed under the law governing the isolation and detention of lepers.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

M. M. Bull, M.B., B.Chir., has been appointed a University Lecturer in Anatomy for three years from April 1.

The following medical degrees were conferred on March 12:

M.D.—S. F. Logan Dahne.
M.B., B.CHIR.—*N. Allsup, *W. Beautyman, A. E. Neill.
* By proxy.

UNIVERSITY OF MANCHESTER

On Founder's Day, May 18, the honorary degree of D.Sc. will be conferred on Alfred Ernest Barclay, D.M., F.R.C.P., Honorary Radiologist and Acting Director, Nuffield Institute for Medical Research, Oxford, for his contributions to medical research, and on Katherine Hope Coward, D.Sc.(Lond.), Reader in Biochemistry and Head of the Nutrition Department in the School of Pharmacy, University of London, for her educational and scientific services.

Alexander William Gordon Ewing, M.A., Ph.D., has been appointed Ellis Llwyd Jones Professor of the Education of the Deaf and Director of the Department, from March 25.

Medical News

King Thanks Hospital Board

The thanks of his Majesty the King have been conveyed to the South-Eastern Regional Hospital Board and to the board of management of the Edinburgh Royal Infirmary for their kindness in granting leave of absence to Professor J. R. Learmonth, Dr. John Gillies, Mr. A. J. Slessor, and Miss Gordon, theatre sister in the Royal Infirmary, so that their services might be available to him in his recent illness. The chairman of the South-Eastern Regional Hospital Board has received a letter signed by Sir Alan Lascelles, his Majesty's Private Secretary. His Majesty also pays tribute in it to the skilful treatment and care he has received, and expresses his thanks to the Royal Infirmary for providing and preparing equipment for the operating theatre at Buckingham Palace. The equipment referred to is the personal instruments of Professor Learmonth and his team. These were prepared and sterilized at the Royal Infirmary two days before the King's operation and sent down in two large baskets to London with the team so that they would have the advantage of working with their own instruments.

Sir Alexander Fleming Honoured

The freedom of the Borough of Chelsea has been conferred on Sir Alexander Fleming, F.R.S., who has lived there since 1921.

Rosenberg Foundation

Dr. Charles Hill, Secretary of the Association, has been invited by the University of California to lecture for the Rosenberg Foundation of San Francisco on the organization of health, medical, and hospital services. He has had to decline the invitation owing to pressure of work in England, including the presidency of the World Medical Association, which he assumes in October.

National Portrait Gallery

Mr. Geoffrey Langdon Keynes has been reappointed by the Lords Commissioners of the Treasury as a trustee of the National Portrait Gallery for a further term of seven years.

President Australian Federal Council

Mr. T. E. Victor Hurley has succeeded Sir Henry Newland as President of the Federal Council of the B.M.A. in Australia.

Faculty of Anaesthetists

The Faculty of Anaesthetists celebrated its first anniversary with a dinner held at the Royal College of Surgeons on March 16. In proposing the health of the College Mr. A. D. Marston, Dean of the Faculty, spoke of his appreciation of the close connexion that now existed between anaesthetists and the Royal College. In reply, Lord Webb-Johnson expressed his delight at the establishment of the Faculty. He pointed out that the anaesthetist was the "clinical physiologist" of the surgical team, and was no longer concerned solely with the supervision of the patient during the operation but was deeply implicated in the pre- and post-operative care of the case. Mr. V. Zachary Cope, toasting the Faculty, commented that it had required no analgesia at its birth and demonstrated that he could express himself in verse with equal ease about anaesthetists as about the acute abdomen. In reply, Dr. Bernard R. M. Johnson, the Vice-Dean, stressed the anaesthetist's concern in the care of the patient before and after his visit to the theatre. Dr. Frankis T. Evans proposed the health of the guests, to which Dr. D. W. Logan, Principal of the University of London, and Sir Cecil Wakeley both replied.

Lecturing in Spain

The British Council is sponsoring a visit to Spain by Professor E. C. Dodds, F.R.S., Courtauld Professor of Biochemistry in the University of London, Director of the Courtauld Institute of Biochemistry (Middlesex Hospital), and editor of the *Journal of Endocrinology*, and Dr. Peter Bishop, consultant to Guy's Hospital, who have been invited by the University of Barcelona to lecture there between March 24 and 30. Professor Dodds's subject is "Theoretical and Practical Aspects of Synthetic Oestrogens," and Dr. Bishop will speak on "Treatment of Functional Menstrual Disorders." These lectures will form part of a month's course on endocrinology arranged by the University of Barcelona Medical Faculty, to which specialists in the subject from several different countries will each contribute a lecture.

Child Welfare

Professor R. W. B. Ellis, of the Department of Child Life and Health, Edinburgh University, and Dr. W. Pearce, of the Scientific Institute for the Study of Delinquency, London, are among those invited by the International Union for Child Welfare to take part in the meeting of the Advisory Committee on Delinquent and Maladjusted Children at the International School of Philosophy, Amersfoort, Holland, on March 28–April 2. The principal subject of discussion will be the training and status of the educational staff in children's and young people's institutions.

Guy's Hospital Dental School

The annual clinical meeting at Guy's Hospital Dental School on March 5 was attended by more than 500 old students. There are at present 350 students in the Dental School at Guy's and many applications for admission have had to be refused. The visitors saw many signs of the rehabilitation of the school since last year, notably the installation of 142 dental chairs of the latest type, a purchase made possible by a university grant. Professor M. Rushton, Nuffield Professor of Dental Medicine, showed some of his work on the structure of teeth. Professor H. R. Fenn demonstrated how polyvinyl chloride could be mixed with appropriate dyes to reproduce clinical material for teaching purposes. Mr. D. J. Anderson showed a method of recording the flow of saliva. Other interesting work on the causation of caries was exhibited in the department of preventive dentistry.

Visit to Greece

Mr. St. John Buxton, the orthopaedic surgeon, and Mr. A. E. Whiffing, technical inspector to the Ministry of Pensions limb-fitting centre at Roehampton, left London for Greece on March 17 for a fortnight's visit sponsored by the British Council and the British Medical Association. Mr. Buxton is lecturing in Athens and Salonika, and his subjects include "Amputation," "Gun-shot Wounds," and "Advances in Orthopaedics (Including Bone Grafting)." Mr. Whiffing, who took with him a crate of artificial British limbs for demonstration purposes, is visiting factories to advise on new methods and appliances. He is accompanying Mr. Buxton on visits to hospitals, including one in the front line.

Hunterian Society

The Hunterian Society's gold medal for 1948 for the best essay by a general practitioner has been awarded to Dr. Jack Lieber for his paper entitled "The Treatment of Obesity in General Practice."

Sheffield Registrars' Group

A United Sheffield Hospitals Registrars' Group was formed on Feb. 4 and has received the official recognition of the United Sheffield Hospitals Medical Committee. The honorary secretary of the group is Dr. R. S. Weetch, Royal Infirmary, Sheffield, 6.

Chinese Award

The President of the National Government of the Republic of China has conferred the Order of the Brilliant Star, with Rosette, upon the Reverend Dr. Arthur Taylor, LL.D., F.R.C.S., in recognition of services rendered during the war.

COMING EVENTS

Physical Society Exhibition

The thirty-third annual exhibition of the Physical Society will be held at the Imperial College of Science and Technology, Prince Consort Road, London, S.W., from April 5 to 8 (both days inclusive).

Tuberculosis Association's Conference

The British Tuberculosis Association's Annual Conference at Cambridge includes the following items in the programme: April 6. *Afternoon:* (1) Dr. J. B. McDougall on "WHO and Tuberculosis"; (2) Dr. R. H. Hazemann, of Paris, on "Tuberculosis in Students and Teachers in France"; (3) Demonstration of tubercle bacilli under the electron microscope in the Cavendish Laboratory. *Evening:* Annual General Meeting. April 7. *Morning:* (1) Mr. Irving Sarot, of New York, on "Resection for Pulmonary Tuberculosis"; (2) Mr.

S. J. McHale, of Birmingham, on "Post-operative Course of Thoracoplasty Cases." *Afternoon:* (3) Dr. J. A. Young, of Cambridge, on "Studies in the Vaccination of Cattle with the Vole Bacillus"; (4) Dr. W. E. Ogden, of Toronto, on "Preclusion of Tuberculous Disease by Preclinical Diagnosis and Control: Twenty Years' Experience." April 8. *Morning:* (1) Dr. J. M. Lemoine, of Paris, on "Atelectasis"; (2) Dr. Conrad Xalabarder, of Barcelona, on "Atelectasis." *Afternoon:* (3) Mr. John Francis on "Infection with the Bovine Tubercle Bacillus, including its Control and a Comparison of Tuberculosis in Man and Cattle"; (4) Dr. Honor Fell, of Cambridge, on "The Relationship between Cells and Tubercle Bacilli in Tissue Culture and *in vivo*," followed by demonstration; (5) Drs. E. M. Brieger and B. R. Smith on "Observation on the Life History of Tubercle Bacilli"; (6) Drs. V. E. Cosslett and E. M. Brieger—Electron Microscopy Studies of Tubercle Bacilli (demonstration). *Evening:* Reception and Annual Dinner. April 9. *Morning:* Visit to Papworth. Talk by Dr. R. R. Trail. Golf.

Contraceptive Technique

A lecture and demonstration (on living models) on contraceptive technique will be given by Dr. Marie C. Stopes and Dr. Beddow Bayly at the Mothers' Clinic, 108, Whitfield Street, Tottenham Court Road, London, W., on Thursday, April 7, at 2.30 p.m. Tickets must be obtained by letter in advance, as space is limited.

Medical Library Association

The Medical Library Association will hold its 48th Annual Meeting on April 10–14 at Galveston, Texas. The Library of the University of Texas Medical Branch will be the host, and headquarters will be at the Hotel Galvez. Addresses include: "Function of the Historical Collections in Medical Libraries," by Dr. John F. Fulton; "The Elmer Belt Library of Vinciana," by Dr. Elmer Belt; and "Bibliography by Co-operation," by Dr. Luther H. Evans. Particulars may be obtained from the secretary, Medical College of Alabama Medical Library, Birmingham 5, Alabama, U.S.A.

Clinical Medicine

A course of instruction in recent advances in clinical medicine will be held at the Broussais Hospital, 96, Rue Didot, Paris, on May 20–22. The subscription for the course is 2,000 francs. Particulars may be obtained from Professor J. Hamburger, 29, Boulevard de Courcelles, Paris, 8e.

Paediatrics Congress

The Sixth International Congress of Paediatrics will be held at Zurich during the last ten days of July, 1950. The congress itself will last four to five days. It is proposed to hold two plenary sessions, each lasting half a day, and a series of simultaneous group sessions. Each group session will consist of prearranged lectures lasting from 10 to 30 minutes, followed by open discussion in which no contribution may exceed 5 minutes. Notifications for important lectures not included in the programme can be accepted only through the secretariats of the various national paediatric societies. The manuscripts of lectures (without illustrations) must reach the Organizing Committee not later than April, 1, 1950. It is planned to hold a scientific exhibition to display the lecturers' graphs, photographs, etc. The Organizing Committee will provide free of charge the exhibition space and cellotex sheets necessary to hang the graphs. Show-cases for lantern slides, coloured photographs, etc., can be provided only if ordered and paid for well in advance. All those invited to lecture can display their material; other conference members must secure special permission from their national paediatric societies beforehand.

SOCIETIES AND LECTURES

Friday

NORTH OF ENGLAND SOCIETY OF ANAESTHETISTS.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, March 25, 7.30 p.m. "*Shock*," by Dr. R. P. Harbord.

Monday

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—March 28, 3.45 p.m. "*The Knee Joint*." Arnott Demonstration by Mr. R. J. Last.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—Jointly with Institute of Urology (University of London), March 28, 5 p.m. "*Neurological Disorders of the Urinary Bladder*." Urology lecture by Mr. David Band.

WESTMINSTER HOSPITAL SCHOOL OF MEDICINE, Meyerstein Lecture Theatre, Horseferry Road, London, S.W.—March 28, 5.30 p.m. "*Steatorrhoea in Childhood*." Clinico-pathological meeting.

Tuesday

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—March 29, 5 p.m. "*Histopathology of the Skin*," by Dr. I. Muende.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—March 29, 5 p.m., "*Cataract Associated with Lesions of the Skin*," ophthalmology lecture by Professor A. Franceschetti (Geneva). 6.15 p.m., "*Ophthalmic Aspects of Protein Deficiency and Disordered Protein Metabolism*," ophthalmology lecture by Professor G. B. Bietti (Pavia).

ROYAL INSTITUTION OF GREAT BRITAIN, 21, Albemarle Street, London, W.—March 29, 5.15 p.m. "*Chemistry of the Actinides and Some Newly Discovered Elements*," by Professor H. J. Emeleus, D.Sc., F.R.S.

Wednesday

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.—March 30, 10 a.m., "*The Relationship of Dental Disease to Diseases of the Throat, Nose, and Ear*," by Mr. A. C. Deverell. Illustrated by lantern slides.

PHYSICAL SOCIETY: COLOUR GROUP.—At Royal Photographic Society, 16, Prince's Gate, South Kensington, London, S.W., Wednesday, March 30, (1) 3 p.m., 9th annual general meeting of the group. (2) 3.15 p.m., 45th science meeting, "*Photoelectric Spectrophotometers and Tricolorimeters*." Discussion to be introduced by Dr. T. Vickerstaff.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—March 30, 5 p.m., "*Psychosomatic Symptoms in Ophthalmology*," ophthalmology lecture by Dr. E. Hartmann (Paris). 6.15 p.m., "*Ophthalmic Manifestations of Besnier–Boeck's Disease*," ophthalmology lecture by Professor H. J. M. Weve (Rijksuniversiteit).

Thursday

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—March 31, 5 p.m. "*Pitfalls in Treatment*," by Dr. H. Gordon.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At B.M.A. House, Tavistock Square, London, W.C., March 31, 8.30 p.m., "*Geriatrics*," by Dr. J. H. Sheldon. A discussion will follow.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—March 31, 5 p.m. "*Surgical Treatment of the Painful Hip Joint*." Hunterian Lecture by Professor Charles Gray.

Friday

MEDICAL SOCIETY FOR THE CARE OF THE ELDERLY.—At Belmont Road Hospital, Liverpool, April 1, 2 p.m. "*Viewpoint on Geriatrics*," by Lord Amulree; "*Overcoming Physical Limitations*," by Dr. Marjory Warren.

SOCIETY OF PUBLIC ANALYSTS: PHYSICAL METHODS GROUP.—At Chemistry Lecture Theatre, The University, Highfields, Nottingham, April 1, 3.30 p.m. 21st Ordinary Meeting. "*Electrophoretic Analysis*." Papers by R. A. Kekwick, D.Sc., Dr. N. H. Martin, A. E. Ambler, B.Sc., Ph.D., and J. Madinaveitia, Ph.D., and A. J. P. Martin, M.A., Ph.D.

Saturday

MEDICAL SOCIETY FOR THE CARE OF THE ELDERLY.—At Belmont Road Hospital, Liverpool, April 2, 9.30 a.m. "*Personality Factors in Senile Psychosis*," by Dr. J. W. Affleck.

SOUTH WESTERN LARYNGOLOGICAL ASSOCIATION.—At Royal Victoria and West Hants Hospital, Shelley Road, Boscombe, Bournemouth, April 2, 2.30 p.m., clinical meeting.

APPOINTMENTS

The Home Secretary has appointed Mr. Geoffrey Keynes to be a member of the Advisory Committee on the Administration of the Cruelty to Animals Act, 1876, in place of Sir Gordon Gordon-Taylor, who has resigned.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—*Assistant Orthopaedic Surgeon, Norfolk and Norwich Hospital*, R. Corfield Howard, F.R.C.S. *Specialist Obstetrician, Peterborough and District Memorial Hospital*, Norman Kimbell, M.B., Ch.B., M.R.C.O.G.

FULHAM HOSPITAL, St. Dunstan's Road, Hammersmith, W.—*Part-time Senior Registrar to the Ear, Nose, and Throat Department*, J. L. Wakelin, M.R.C.S., L.R.C.P., D.L.O. *Junior Anaesthetics Registrar*, S. Mehlman, M.D.

HALL, HOWARD W., M.B., CH.B., D.P.H., Deputy Medical Officer of Health and Deputy School Medical Officer for the County Borough of Wallasey.

RICE, HUGH MACAN, M.D., Pathologist in Charge, Nottingham General Hospital.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Kelly.—On March 9, 1949, at St. Anne's Nursing Home, Pinner, to Pamela (née Mountain-Palmer), wife of Dr. T. L. Kelly, Eastcote, Middlesex, a son—Nigel.

Mackenzie.—On March 12, 1949, at Shrewsbury, to Marjorie (née Teague), wife of Dr. G. K. Mackenzie, a daughter.

Portch.—On March 1, 1949, at Caythorpe, to Thelma (née Morris, S.R.N.), wife of Dr. G. G. Portch, a son—Christopher John.

DEATHS

Atkinson.—On March 12, 1949, at 202, Abington Avenue, Northampton, Edward William Atkinson, M.R.C.S., L.R.C.P., late of Long Buckley, near Rugby, Northants, aged 67.

Bates.—On March 18, 1949, at Bartlemas, Sandwich, Kent, John Edwin Bates, T.D., M.B., B.Ch., late of Wimbledon, aged 79.

Brown.—On March 13, 1949, at Littlewood, Cranleigh, Daniel Durward Brown, M.D., aged 82.

Bruce.—On March 14, 1949, at Woburn, Bedfordshire, Robert Tennant Bruce, M.D.Ed., aged 76.

Buck.—On March 9, 1949, Arthur Herbert Buck, F.R.C.S.Ed., aged 79.

Bulstrode.—On March 18, 1949, at Salt Hill House, Chichester, Sussex, Christopher Victor Bulstrode, D.S.O., M.D.

Conner.—On March 16, 1949, at All Hallows Vicarage, Greenford, John Richard Tarrant Conner, M.D.

Cooper.—On March 13, 1949, at Stoneleigh, Salcombe, S. Devon, Charles Edward Cooper, M.B., B.Ch.

EPIDEMIOLOGICAL NOTES

Influenza

There were 321 deaths in the great towns in the week ended March 12, compared with 259 in the previous week. Deaths remained practically the same in London and the south-east, but there was a rise in the north, particularly in the north-west, and in the Midlands. The incidence has been high in certain places—for example, Salford, the West Riding of Yorkshire, and Birmingham—but the disease has been of a mild type. From one London borough a report has been received that four patients suffering from influenza developed coffee-ground vomiting and melaena. Nearly all the isolations of virus have been of virus A, but virus B has been found in material received from two school outbreaks and from one fatal case of staphylococcal pneumonia at Leicester.

Registrar-General's Review for 1946

The review issued on March 24 covers the first post-war year. There were 820,719 live births in England and Wales in 1946, which represented a birth rate of 19.2 per 1,000 total population. This was an increase of 3.3 per 1,000 over the rate in the previous year and the highest since 1923, when it was 19.7. Later figures show that the birth rate further increased to 20.5 in 1947 but fell considerably in 1948, the provisional rate for that year, based on the total number registered, being 17.9. There were 53,919 illegitimate births in 1946, a proportion of 6.6% of the total, compared with 9.3% in the previous year. This proportion has since fallen again to 5.3% in 1947. Stillbirths numbered 22,915, representing a rate of 27 per 1,000 live and stillbirths compared with 28 in the previous year, but figures for subsequent years show that by 1948 this rate had fallen to 23.

Of the "legitimate maternities" during the year 44.9% were to mothers with no surviving previous children; 30.2% to mothers with one surviving child; and 12.9% to mothers with two surviving children. There were 10,788 maternities resulting in multiple births, of which 85 were triplets; no quadruplets were born in 1946. Of about 88,000 confinements which took place within 11½ months of marriage some 43,000 occurred within 8½ months of marriage, and of these 36,000 occurred within 7½ months of marriage.

Discussion of Table

In *England and Wales* infectious diseases were less prevalent and there were decreases in the notifications of measles 1,436, whooping-cough 392, acute pneumonia 107, scarlet fever 73, diphtheria 18, dysentery 14, and cerebrospinal fever 13.

A large fall in the notifications of measles was recorded; during the preceding five weeks the weekly number had been doubled. The largest decreases in the incidence of measles during the week were Southampton 324, Staffordshire 284, Devonshire 199, Lancashire 188, Essex 134, Cheshire 118, and Yorkshire West Riding 116; the only large increase was London 250.

Notifications of whooping-cough decreased in most areas, but notably in Lancashire 84. A decrease of 8 in Lancashire was the chief feature of the returns of diphtheria. The fall in the incidence of acute pneumonia was shown mainly in the southern section of the country.

The only large return for dysentery was 24 in Lancashire, where there were 17 notifications fewer than in the preceding week.

In *Scotland* a slight decrease was reported in the incidence of infectious diseases; the falls included acute primary pneumonia 42 and scarlet fever 10. The decline in the incidence of scarlet fever was mainly contributed by the south-eastern area. In the western area a rise of 8 occurred in the notifications of diphtheria.

In *Eire* increases were recorded in the notifications of measles 55, whooping-cough 23, and diarrhoea and enteritis 16. The increased incidence was spread throughout the country, although Dublin C.B. accounted for a large part of it.

In *Northern Ireland* an increase of 69 in the notifications of measles and a decrease of 51 in the notifications of whooping-cough were recorded. The rise in the incidence of measles occurred in the counties of Antrim and Down. A fall in the notifications of whooping-cough was reported throughout the country.

Week Ending March 12

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,178, whooping-cough 2,621, diphtheria 101, measles 17,305, acute pneumonia 1,514, cerebrospinal fever 35, acute poliomyelitis 17, dysentery 49, paratyphoid 3, and typhoid 1.

No. 9

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 5.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1949					1948 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	33	2	13	—	1	42	4	37	—	6
Deaths		—	1				2	2		
Diphtheria	101	13	28	2	5	200	21	60	8	2
Deaths	—	—	1	—	1	5	1	—	—	—
Dysentery	65	5	23	—	2	184	22	37	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	2	1	—	1	1	—	—	1	—	—
Deaths		—					—			
Erysipelas			33	8	4		1	55	13	5
Deaths		—								
Infective enteritis or diarrhoea under 2 years				49					20	
Deaths	28	—	—	4	—	49	3	7	1	—
Measles*	18,619	1081	166	175	214	8,788	1303	775	78	34
Deaths†			—	—	—			4	—	—
Ophthalmia neonatorum	34	—	9	—	—	67	6	6	1	1
Deaths										
Paratyphoid fever	5	—	3(B)	—	—	2	1	6(B)	—	1(B)
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	1,500	72	33	11	21	794	45	10	8	3
Deaths (from influenza)‡	259	48	11	1	5	27	2	1	1	—
Pneumonia, primary			261	51				277	22	
Deaths	458	75		11	17	316	60		15	9
Polio-encephalitis, acute	1	—				1	—			
Deaths										
Poliomyelitis, acute	9	—	2	—	—	22	2	2	2	—
Deaths§	1	—				6	—			
Puerperal fever		—	7				2	12		—
Deaths										
Puerperal pyrexia‖	103	6	9	1	—	94	6	13	—	—
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,189	54	182	101	30	2,069	136	347	48	60
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	4	—	—	3	—	5	2	—	—	—
Deaths	—	—	—	—	—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	2,653	218	247	106	66	3,067	217	44	63	8
Deaths	7	—	1	—	—	10	1	—	1	—
Deaths (0–1 year)	318	40	44	15	11	430	49	45	27	8
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	6,502	1010	717	181	176	5,914	956	668	221	139
Annual death rate (per 1,000 persons living)			12·7	10·9				13·5	13·8	
Live births	7,438	1215	929	357	259	8,369	1317	944	404	266
Annual rate per 1,000 persons living			18·6	22·1				19·1	25·3	
Stillbirths	178	35	29			231	37	28		
Rate per 1,000 total births (including stillborn)			30					29		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales, Eire, and Northern Ireland.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Heredity and Pulmonary Tuberculosis

Q.—*It is said that the genetic factor is mainly responsible for some people's developing clinical pulmonary tuberculosis, whereas the majority do not. How much is known about this, and can you tell me where I can find details?*

A.—The writer is not aware of any recent authoritative review of the part played by heredity in determining susceptibility to pulmonary tuberculosis. The evidence that genetic constitution is of importance is based on familial and especially twin studies, on considerations of racial differences, and on laboratory work on animals. Probably the most important single contribution is that of Kallmann and Reisner (*Amer. Rev. Tuberc.*, 1943, **47**, 549). Briefly, they found that the chance of developing adult-type pulmonary tuberculosis before the age of 30 in the general population of the State and City of New York was 1.4%. For the various relatives of sufferers the chances were as follows: husbands and wives, 7.1%; half-sibs, 11.9%; parents, 16.9%; full sibs, 25.5%; fraternal co-twins, 25.6%; identical co-twins, 87.3%. This indicates that hereditary constitution is of considerable importance. When the patients were classified in more detail according to the extent and course of the disease, identical twins were actually sixteen times more like each other than fraternal twins. This finding is in harmony with the view that the importance of hereditary constitution lies in the degree of resistance to the established infection rather than in determining whether infection is contracted or not. Observations on man accord well with those on experimental animals, the behaviour of different human populations being paralleled by strains of differing resistance or susceptibility. Thus in Lurie's experiments, in which a low intensity of exposure was used, certain rabbits of high genetic resistance acquired an infection that healed completely, while others, of low genetic resistance, developed fatal tuberculosis.

It is important to realize that the interaction of hereditary and environmental influences must be complex, and the relative importance of heredity will not be the same against different environmental backgrounds. It might not be going too far to suggest that there is no degree of genetic resistance, however high, that could not be overcome by a sufficiently malignant combination of massive infection and adverse environmental conditions; similarly it may be that even those of the greatest genetic susceptibility could be successfully protected under optimum conditions. Kallmann and Reisner's findings apply to conditions as they existed in the nineteen-thirties in the State and City of New York, and the relative importance of hereditary constitution might be very different—either greater or less—in different communities living in different circumstances. It might well be that, in a community living in bad conditions and with a very high incidence of the disease, hereditary constitution would be found to be relatively less important; while in a community enjoying special advantages, and in which the incidence of the disease had been reduced to a very low figure, the influence of heredity would appear to be great; in other words, in such a community those who succumbed in spite of advantageous circumstances would be those who chanced to be genetically strongly predisposed.

Anuria after Sulphonamides

Q.—*In domiciliary practice the administration of sulphonamides at intervals of less than 8 hours is difficult, especially during the night. I therefore use sulphamerazine 8-hourly, the last dose being at 10 or 11 p.m. However, I know of two cases of anuria following small doses of this drug, and I feel that this complication is more common with sulphamerazine than with other sulphonamides. Would using sulphathiazole 4-hourly during the day, substituting sulphamerazine in corresponding dose at 10 p.m. and starting sulphathiazole at 6 a.m. the next morning maintain as effective a concentration of sulphonamide as either drug given separately at the intervals appropriate to itself? Have you any other suggestions for combining minimum toxic effects with adequate blood level of sulphonamide and 8 hours' sleep for the family?*

A.—The best method of dealing with the risk of anuria when using sulphonamides is to give a mixture of sulphathiazole, sulphadiazine, and sulphamerazine. The solubility of any one of these does not affect that of the others. It must be given with plenty of fluid and with sodium citrate in order to keep the urine alkaline. With an alkaline urine there is much less risk of renal symptoms, since the solubility of these substances is greater. If one sulphonamide is to be used alone, sulphathiazole is the least likely to cause toxic symptoms, because it is much more soluble than either sulphadiazine or sulphamerazine, provided the urine is alkaline.

It is clear that an eight-hourly dosage cannot possibly maintain as steady a blood concentration as a four-hourly dosage. Is the question of eight hours' sleep for the family of great importance, in view of the short period for which the sulphonamides are usually given—that is to say, for a maximum of 6 to 8 days?

Hemivertebra

Q.—*A boy aged 7 has developed a lateral curve in the lumbar region. X-ray examination demonstrates that he has an extra lumbar half-vertebra. Can you advise me about the treatment of this condition?*

A.—The problem of scoliosis is one of the most difficult in orthopaedic surgery, and when the condition is due to congenital hemivertebra the difficulties are even more formidable. Hemivertebra is due to failure of development of one of two lateral centres of ossification of a vertebral body when this is not formed, as it is normally, from a single central ossific centre. It leads to increasing lateral curvature from an early age, and unless treatment is effective the ultimate deformity may be severe. Because the scoliosis is structural in origin, correction is even more difficult than in the ordinary postural scoliosis. For this reason a number of patients have been treated by excision of the hemivertebra. This is a rational method, and though the operation is difficult it is quite practicable in the lumbar region. If excision is deemed inadvisable, treatment will usually follow principles similar to those employed in other varieties of scoliosis. The spine is mobilized as much as possible by a short intensive course of exercises, and, if the deformity is severe or is judged to be increasing, correction is attempted, usually by a divided plaster jacket with a hinge. When maximal correction has been secured an appropriate length of the spine is fused, if necessary in stages, in the hope of maintaining the correction that has been achieved. The most hopeful cases are those in which deformity is of relatively late onset, and in which correction and fusion are consequently not required until the later years of childhood. But when severe deformity is found in early childhood, and particularly if it is increasing, correction and fusion may have to be undertaken without delay. Cases of hemivertebra—apart from those treated by excision—usually fall into this category; and it is unfortunately true that, however intensive and efficient the treatment, the results often leave much to be desired.

Alarming Dreams in the Aged

Q.—*Many old people frequently have alarming dreams, such as hanging on to the edge of a precipice, and they wake up in a distressed condition. Is there any known treatment by which the dreams can be prevented or modified? Is it possible that many deaths which occur during sleep may be due to such dreams?*

A.—There are some who give a physiological explanation for such dreams, ascribing them to a fall in blood pressure. Possibly this may be the precipitating cause, but obviously the form of the dream—clinging on to a precipice, etc.—cannot be derived from that and demands a psychological explanation.

Dreams are the manifestation during sleep of unsolved problems, many of which are associated with fear. Dreams of falling may be revivals of actual experiences, usually in earliest childhood, when we can do least about it; or they may be symbolic fear of a moral lapse or failure in business or fear of death. Such dreams occur at all times of life, and are not confined to old age, though possibly the lowered inhibition of old age may make them more acute, so that frightening experiences, which occur especially in the helplessness of childhood (including the fear of falling, one of the strongest of primitive fears), emerge into consciousness.

In so far as the fear is psychologically determined, the cure is to get the patient to discover what *latent* fear he may have and face up to it. Otherwise the palliative treatment might be tried of producing deeper sleep by hypnotics; but if this treatment is not successful it sometimes makes the patient worse, since the drugs lessen the inhibition to the repressed fears.

As to the last question on the possibility of nightmares producing death, the general opinion is the other way round. It is now fairly well established that some organic diseases which are not sensed during the day give rise to dreams regarding the affected organ during the night, just as *external* stimuli like an alarm clock may produce a dream. I have had a case in which a patient on two occasions had a dream of being paralysed on the right side, and a few weeks later developed it in fact—not a hysterical but an organic paralysis. Similarly some people have anxiety dreams coming from disease of the heart, and then may die of such disease. Jung has made a special study of this subject, which is also referred to in Freud's *Interpretation of Dreams.*

Marriage of Double First Cousins

Q.—*I have been approached by a young woman for advice on her proposed marriage. Both her own father and her fiancé's are brothers, and the mothers are sisters. As this makes the young couple closer relations than the common first cousins, what are the risks to their children?*

A.—One of the risks inherent in any marriage is that both partners may happen to carry the same harmful recessive gene; any child will then have a 1 in 4 chance of suffering from the condition. This risk is increased in a marriage of blood relatives, who share some of their genes in common. One-eighth of the genes of first cousins are the same, having been received from their common ancestry; in the marriage of double first cousins, as mentioned in the question, the proportion is one-quarter. The consequences may be illustrated by some approximate figures. The chance that any child from a random unrelated marriage will suffer from what is perhaps the commonest serious recessive defect, recessive retinitis pigmentosa, is about 1 in 5,000. The corresponding chance in a marriage of first cousins is about 1 in 1,100, and in a marriage of double first cousins about 1 in 550. To take a much rarer condition—alcaptonuria—the chance of its occurrence in a child from an unrelated marriage is about 1 in 1,000,000, in a first-cousin marriage about 1 in 16,000, and in a double-first-cousin marriage about 1 in 8,000. It will be appreciated, therefore, that the risk of the appearance of some undesirable recessive trait or other is much increased in a marriage of blood relatives. But it is a relative risk; what interests the individual is the absolute risk—that is, the sum of all these chances for all undesirable recessive genes. This is not known, and so it is impossible to say how large the risk may be that in a cousin (or double-cousin) marriage some harmful recessive condition or other may appear. It seems likely, however, that the chance is not large in comparison with all the other risks inherent in pregnancy, childbirth, and early life. For example, it is probably not as great as the risk of haemolytic disease in later-born children in the marriage of an Rh-negative woman to an Rh-positive man. While, then, it must be recognized that the risk is increased, it is probably not of such magnitude that the average sensible person, with a knowledge of the facts, need feel that it outweighs other considerations favouring the marriage. There is one reservation, however. If there is a history of recessively determined abnormality in either family the chance might be relatively large. Scrutiny of the family history would then be necessary, and the proposed marriage might have to be pronounced definitely unwise.

NOTES AND COMMENTS

Chemotherapy of Acute Otitis Media.—Mr. L. F. DAY (Hastings) writes: I did not think that the answer given to the question concerning the very important matter of chemotherapy in acute otitis media ("Any Questions?" March 5, p. 422) was quite in accord with the usual view held by otologists. The answer that I give when asked, as one is asked frequently, is never to give any form of chemotherapy unless there is a free exit for the exudate in the middle-ear cleft or unless myringotomy is imminent. I was sorry to see that the dangers of giving sulphonamides or penicillin in closed infections of the tympanic cavity were not more stressed. To suggest that it is wiser to open the drum if it is red and bulging before giving sulphonamides is putting it very mildly. It is not uncommon to see an extensive necrosis of the mastoid process proceeding under the mask of an adequate dose of one of the sulphonamides, particularly if myringotomy has not been performed. I had such a case recently in which the tympanic membrane was intact, but it was necessary to do a very extensive exenteration of the mastoid cells, exposing the dura mater and lateral sinus widely. This child was 6 years of age and had been on a sulphonamide for two weeks. I have seen children who have been on one of the sulphonamide drugs for ten days who were free from pyrexia and pain but who were severely deaf, with tympanic membranes like wet tissue-paper. The prospect in these cases with regard to the hearing is poor. I know of a few who still show a marked hearing loss six months afterwards. My practice is to make an adequate incision in the tympanic membrane and then to give sulphonamides, or, if the case is a fulminating one, penicillin. Only thus is it possible to ensure a rapid return to normal of the vital structures within the tympanic cavity. I do not believe that the fact that many cases of acute suppurative otitis media may recover, apparently with complete return of the hearing, without myringotomy justifies withholding this simple procedure when the indications for it are present. Apart from the fact that it is the safest course to adopt it gives immediate relief of pain, a shorter convalescence, and a rapid recovery of the hearing loss. There are no complications. With regard to the very early cases, I should say that it would be most unwise to put every child with earache and some injection of the tympanic membrane on a four days' course of chemotherapy. Many of these cases resolve spontaneously in a short time without any interference, before bulging of the drumhead occurs, and there are other measures that can be used to hasten recovery. Retained muco-pus in the middle-ear cleft, although the virulence of the organisms may be reduced by drugs, is always liable to organize and form fibrous tissue, causing an adhesive otitis media and permanent deafness. The danger may not be so great in older persons, but in young children it is not possible accurately to assess the hearing, and permanent damage may occur without its becoming apparent for years. There are so many cases to-day of long-standing deafness of obscure origin dating from an early age, and it seems not unlikely that there will be very many more in the future if the administration of sulphonamides or penicillin is not combined with daily inspection of the drumhead and careful supervision. With a free discharge of the exudate there can be few more useful purposes to which these drugs can be applied.

Keloid.—Dr. E. JACOBSEN (Kirkby Stephen, Westmorland) writes: In answer to a question regarding the treatment of keloids ("Any Questions?" Feb. 26, p. 377), I should like to mention a more harmless method which is worth-while trying, and which I have used with satisfactory results. It is based on the idea that pepsin has a digestive action on scar tissue. It can be applied either as a compress soaked in a 5% glycerin-pepsin solution, with a piece of oiled silk to keep it moist, or as the following ointment: pepsin 5.0, boric acid 3.0, petroleum jelly to 100.0. Massage with the same ointment is also recommended. The treatment should be continued for several months.

Sir Benjamin Ward Richardson.—Mrs. OLGA SOMECH PHILLIPS (4, Perceval Avenue, Belsize Park, N.W.3) writes: I should be grateful if any of your readers could give me personal reminiscences of the late Sir Benjamin Ward Richardson. I should be glad, too, to know of any unpublished writings of his or any letters.

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